

Volume I of IV (Appx34-Appx700)
2023-1917, 2023-1918 and 2023-1919

**United States Court of Appeals
for the Federal Circuit**

QUANTIFICARE S.A.,

Appellant,

— v. —

CANFIELD SCIENTIFIC, INC.,

Appellee.

*On Appeal from the United States Patent and Trademark Office,
Patent Trial and Appeal Board in Nos. IPR2021-01511,
IPR2021-01518, IPR2021-01519*

JOINT APPENDIX

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QuantifiCare S.A. v. Canfield Scientific, Inc.
Appeal Nos. 2023-1917/2023-1918/2023-1919

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Paper 61
Date: March 9, 2023

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CANFIELD SCIENTIFIC, INC.,
Petitioner,

v.

QUANTIFICARE S.A.,
Patent Owner.

IPR2021-01511
Patent 10,070,119 B2

Before BRIAN J. MCNAMARA, JOHN D. HAMANN, and
BRIAN D. RANGE, *Administrative Patent Judges*.

RANGE, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
Denying In Part and Dismissing In Part Patent Owner's Motion to Exclude
35 U.S.C. § 318(a)

IPR2021-01511
Patent 10,070,119 B2

I. INTRODUCTION

This is a Final Written Decision addressing the *inter partes* review challenging claims 1–4 and 8–11 of U.S. Patent No. 10,070,119 B2 (“the ’119 patent,” Ex. 1001). We have jurisdiction under 35 U.S.C. § 6. The evidentiary standard is a preponderance of the evidence. *See* 35 U.S.C. § 316(e) (2018); 37 C.F.R. § 42.1(d) (2019). We issue this Final Written Decision pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73 (2022). For the reasons that follow, we determine that Canfield Scientific, Inc. (“Petitioner”) demonstrates, by a preponderance of the evidence, that the challenged claims are unpatentable.

II. BACKGROUND

A. *Procedural History*

Petitioner filed a Petition (Paper 1, “Pet.”) requesting *inter partes* review of claims 1–4 and 8–11 of the ’119 patent. After institution, QuantifiCare S.A. (“Patent Owner”) filed a Patent Owner Response. *See* Paper 21 (“PO Resp.”). Petitioner filed a Reply (Paper 30, “Reply”), and Patent Owner filed a Sur-Reply (Paper 42, “PO Sur-reply”). Additionally, Patent Owner filed a motion to exclude evidence (Paper 46, “Mot. Excl.”), Petitioner responded (Paper 47, “Opp. Mot. Excl.”), and Patent Owner provided a reply brief (Paper 53, “Mot. Excl. Reply”).

We heard oral argument for this *inter partes* review (as well as for two related *inter partes* reviews, IPR2021-01518 and IPR2021-01519) on December 14, 2022, and a transcript of the hearing is part of the record of this proceeding. Paper 60 (“Tr.”).

B. *Related Matters*

The parties identify the following as a related matter: *QuantifiCare, Inc. v. Canfield Scientific, Inc.*, C.A. No. 1:20-cv-12305 (D.N.J.). Pet. 3;

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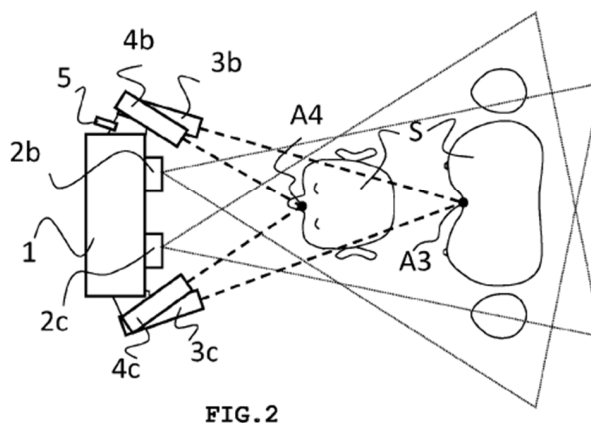
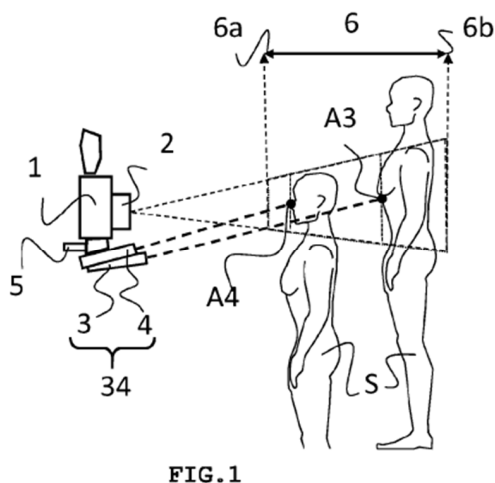
Patent 10,070,119 B2

Paper 4, 1. In addition, Petitioner has filed a petition for *inter partes* review of two additional patents related to the '119 patent that are also owned by Patent Owner: (i) U.S. Patent No. 10,165,253 B2 (IPR2021-01518) and (ii) U.S. Patent No. 10,681,334 B2 (IPR2021-01519).

C. The '119 Patent (Ex. 1001)

The '119 patent is titled “Device and Method to Reconstruct Face and Body in 3D.” Ex. 1001, code 54. The challenged patent relates to a stereophotogrammetry device used “to picture and reconstruct in 3D the surface of objects of different sizes,” e.g., different body parts such as the face and the torso. *Id.* at 3:22–25; *see id.* at 1:6–14, 1:41–48. By way of background, the '119 patent explains that “[s]tereophotogrammetry consists in [simultaneously] gathering the images of a subject from at least two views with a calibrated camera,” i.e., a “stereo-pair.” *Id.* at 1:24–29. The stereo-pair is used to “reconstruct . . . a dense representation in 3-Dimensions of the surface of the observed object.” *Id.* at 1:30–32.

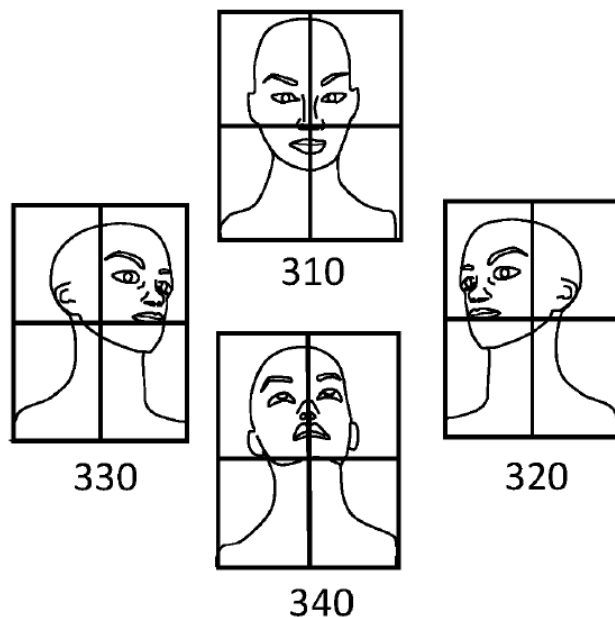
Figures 1 and 2, reproduced below, respectively show side- and top-views of an “implementation” of a stereophotogrammetry device and its components. *Id.*



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Figure 1 represents a possible implementation of the '119 patent's device as viewed from the side, and Figure 2 represents a possible implementation of the device as viewed from the top. *Id.* at 3:48–51. As shown in Figures 1 and 2, camera body (1) includes double optics (2). *Id.* at 8:23–24. As shown in Figure 2, double optics (2) are “composed of two sub-optics (2*b*) and (2*c*), enabling the acquisition of a stereo[-]pair [of images] corresponding to two slightly different viewing angles” simultaneously. *Id.* at 8:24–27; *see id.* at 3:28–31. For example, Figure 8, shown below, shows a series of stereo-pair images taken at different angles for a face. *Id.* at 11:1–8.

**FIG. 8**

The '119 patent specification describes Figure 8 as presenting “viewpoints optimized for imaging a face using a field of view close to an A4 surface format.” *Id.* at 3:66–67. Using the captured stereo-pairs, “a comprehensive representation in 3D of the surface of the subject (S)” can be constructed. *Id.* at 10:26–37.

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Further, the stereophotogrammetry device captures stereo-pairs of images at “two distinct distances for picture taking corresponding respectively to position (A3) and (A4)” such that the stereo-pairs of images are in focus at positions A3 and A4, which are within the device’s depth of field 6. *Id.* at 8:29–39; *see id.* at 6:23–26. For example, position A3 is used for capturing images of the torso while position A4 is used for capturing images of the face. *Id.* at 6:3–12; *see id.* at 1:41–48. Positions A3 and A4 can be identified by the convergence of respective light patterns projected onto the subject to be imaged, the respective light patterns converging at the distances for positions A3 and A4. *Id.* at 4:46–67. For example, as shown in Figure 2, a light pattern emitted by first pair of light beamers (3b) and (3c) converge at point (A3) and a different light pattern emitted by second pair of light beamers (4b) and (4c) converge at point (A4). *Id.* at 8:40–44; *see id.* at 4:56–59. Accordingly, “by placing the subject so that the light patterns projected by a first pair of beamers are superposed on the surface of the subject[,] one is placing the subject at” the first pre-defined position (and similarly for the light pattern emitted by the second pair of beamers converging at the second position). *Id.* at 4:48–56; 5:10–26.

D. Challenged Claims

Petitioner challenges claims 1–4 and 8–11 of the ’119 patent. Pet. 1. Claim 1 is the only challenged independent claim. Claim 1 is illustrative of the claimed subject matter, and we reproduce claim 1 with Petitioner’s added bracketed identifiers and line breaks for claim elements.

1. [1.01] A device for stereophotogrammetry comprising
[1.02] a camera body (1) and

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[1.03] a double-optics (2) comprising two sub-optics (2*b*) and (2*c*), configured for a simultaneous acquisition of two views according to two different angles,

[1.04] wherein the device is comprising a positioning system (34) configured to define a position of a target subject (S) for one of at least two distinct pre-defined point positions (A3, A4) of the target subject (S) relative to the stereophotogrammetry device,

[1.05] the at least two distinct predefined point positions comprising a closer point position (A4) and a farther point position (A3), the closer point position (A4) being closer to the stereophotogrammetry device than the farther point position (A3), and wherein the positioning system (34) is comprising at least two pairs of light beamers (3*b*, 3*c*) and (4*b*, 4*c*) where a first pair of light beamers (3*b*, 3*c*) is converging to the farther point position (A3) and a second pair of light beamers (4*b*, 4*c*) is converging to the closer point position (A4), and

[1.06] wherein the device comprises a switch (5) comprising a first selection position configured to select the farther point position (A3) and a second selection position configured to select the closer point position (A4),

[1.07] wherein the switch (5) is configured to switch on the first pair of light beamers (3*b*, 3*c*) in the first selection position and wherein the switch (5) is configured to switch on the second pair of light beamers (4*b*, 4*c*) in the second selection position.

Ex. 1001, 11:32–57; *see also* Pet. 16 (using same identifiers).

E. Asserted Grounds of Unpatentability

We instituted trial based on the following grounds of unpatentability, which are all the grounds of unpatentability raised in the Petition:

Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1	1–4, 8	103	Plassmann ¹ , Treuillet ² ,

¹ WO 2010/097572 A2, published Sept. 2, 2010 (Ex. 1007).

² Sylvie Treuillet et al., *Three-Dimensional Assessment of Skin Wounds Using a Standard Digital Camera*, IEEE Transactions on Medical Imaging, Vol. 28, No. 5 at 752 (2009) (Ex. 1016).

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Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
			Staller ³
2	9–11	103	Plassmann, Treuillet, Staller, Peng ⁴

Pet. 5. The Petition and Reply are supported, for example, by declarations of Dr. Gerhardt Paul Otto, Ph.D. Exs. 1003, 1053. The Response and Sur-Reply are supported, for example, by declarations of Dr. Daniel van der Weide. Exs. 2006, 2013.

III. PATENT OWNER’S MOTION TO EXCLUDE

Patent Owner’s Motion to Exclude seeks to exclude two areas of evidence. We address each in turn.

A. *Exclusion of Dr. Otto’s Testimony to the Extent it Espouses and Relies on Inadmissible Hearsay*

Patent Owner argues that testimony of Petitioner’s witness, Dr. Otto, should be excluded to the extent Dr. Otto relies on statements regarding the depth of field of the MAVIS II system discussed in Treuillet because Treuillet’s statements are hearsay and not the kinds of fact an expert would reasonably rely upon. Mot. Excl. 1–12. Patent Owner further argues that Treuillet’s description of MAVIS II is inconsistent with Plassmann’s writings concerning MAVIS and should be excluded for this reason as well. *Id.* at 13–14.

Patent Owner’s argument for exclusion is unpersuasive for three reasons. First, as Petitioner argues in opposition to the motion to exclude, Treuillet is admissible as prior art. Opp. Mot. Excl. 2–3. Petitioner and Dr.

³ US 7,257,322 B2, issued Aug. 14, 2007 (Ex. 1006).

⁴ Qi Peng et al., *Automated 3D Scenes Reconstruction Using Multiple Stereo Pairs from Portable Four-Camera Photographic Measurement System*, International Journal of Optics, Vol. 2015 (2015).

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Otto rely on Treuillet for what the Treuillet reference teaches to a person having ordinary skill in the art at the relevant time. Treuillet's suggestions to a person having ordinary skill in the art remain relevant even if Treuillet were factually incorrect in some respects.

Second, even if considered hearsay, Dr. Otto properly relied on Treuillet. Opp. Mot. Excl. 4–7. Under Federal Rule of Evidence 703, an expert may rely on facts and data that “need not be admissible,” including hearsay (double or otherwise). Here, the evidence supports that Treuillet was published in an independent, respected, and peer-reviewed IEEE journal. *Id.* at 5–6 (citing evidence regarding reliability of the IEEE journal). In addition, we find unavailing Patent Owner's arguments concerning “Reference 45.”⁵ Mot. Excl. 3–5; Reply Mot. Excl. 1–5. Rather, we find that it is appropriate for an expert also to rely on the sourcing in article published in such an IEEE journal. Thus, Treuillet is the kind of evidence we would expect an expert witness or person having ordinary skill in the art to rely upon, and Dr. Otto was entirely reasonable on relying on Treuillet in forming his opinions

Third, even if Treuillet were inconsistent with other evidence, such as Plassmann, this issue would go to the credibility of Dr. Otto's testimony and the weight given to it in deciding ultimate issues of fact rather than admissibility in the first instance.

For the reasons above, we deny Patent Owner's motion to exclude with respect to Dr. Otto's testimony.

⁵ Treuillet cited this reference as follows: “MAVIS II: 3-D wound instrument measurement Univ. Glamorgan, 2006 [Online]. Available: <http://www.imaging.research.glam.ac.uk/projects/wm/mavis/>.” Ex. 1016, 762.

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B. *Exhibits 1018, 1019, 1026, 1028–1030, 1033, and 1034*

Patent Owner seeks to exclude Exhibits 1018, 1019, 1026, 1028–1030, 1033, and 1034 because “the Petition does not cite or otherwise rely on them.” Mot. Excl. 14–15. Petitioner argues that it relied on all of these exhibits aside from Exhibits 1018 and 1019.

In rendering our decision, we only consider Petitioner’s evidence to the extent it is properly presented in the Petition or the Reply. We consider Petitioner’s evidence that Dr. Otto cites only to the extent explanation of the evidence is properly presented in the Petition or the Reply or only for purposes of assessing whether Dr. Otto’s testimony presented in the Petition or the Reply is well-grounded. As such, resolution of Patent Owner’s motion to exclude with respect to these exhibits would not affect our decision making and is therefore moot.

For the reasons above, we dismiss as moot Patent Owner’s motion to exclude these exhibits.

IV. PATENT OWNER’S OBJECTIONS TO PETITIONER’S DEMONSTRATIVES

Patent Owner objects to a number of Petitioner’s demonstratives for oral argument because, for example, the demonstratives constitute evidence that Petitioner did not reference or discuss in a prior paper. *See, e.g.*, Paper 58, 2. Patent Owner also objects to certain demonstratives as mischaracterizing the record. *Id.* at 1.

Demonstratives for oral argument are not evidence, and we do not rely on demonstratives as evidence in our decision making. Paper 45, 2 (Order Setting Oral Argument). Because demonstratives do not affect our decision making, Patent Owner’s objections to the demonstratives likewise do not affect our decision making and are therefore moot.

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V. ANALYSIS

A. *Level of Ordinary Skill in the Art*

To determine whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). In assessing the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citing *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962–63 (Fed. Cir. 1986)). “[O]ne or more factors may predominate.” *Id.*

Petitioner argues that

[a] person of ordinary skill in the art (“POSITA”) would have had a working understanding of photography, stereophotogrammetry, and distance measuring in photography or stereophotogrammetry. Such an individual would have a master’s degree with a scientific focus on subjects such as optics and/or image processing, with at least about three years of experience in the field of photography, and stereophotogrammetry, as well as image processing in these fields, or an equivalent qualification.

Pet. 15 (citing Ex. 1003 ¶¶ 17–20).

Patent Owner argues that a person having ordinary skill in the art “would have a Bachelor’s degree in Physics or Electrical engineering or a similar field and two to three years of experience, including in image processing and computer graphics” and that Petitioner’s “assertion of a higher level . . . is incorrect.” PO Resp. 23.

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The parties do not substantively address the differences in their proposed definitions for one of ordinary skill in the art. Pet. 15; PO Resp. 23; *see generally* Reply; PO Sur-reply. Moreover, the parties agree that which definition we adopt does not substantively impact our analysis of the parties' arguments concerning unpatentability. Tr. 29:19–30:9, 75:20–25.

Because Patent Owner's definition of the level of skill in the art is consistent with the '253 patent and the asserted prior art, we adopt it for purposes of this Final Written Decision. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *GPAC*, 57 F.3d at 1579; *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978). In addition, we do not find support in the record for requiring one of ordinary skill in the art to have had a master's degree. Pet. 15; Ex. 2013 ¶ 31 (testifying why a master's degree was unnecessary). Our analysis herein, however, does not turn on which of the parties' definitions we adopt.

B. Claim Construction

Because the Petition was filed after November 13, 2018, we apply the same claim construction standard that would be used in a civil action under 35 U.S.C. § 282(b), following the standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b) (2021). In applying such standard, claim terms are generally given their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art, at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v.*

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Medtronic Sofamor Danek, Inc., 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

Petitioner submits “that [no] express constructions are required for any terms.” Pet. 17. Patent Owner argues that the claim terms should have their plain and ordinary meaning. PO Sur-reply 1. The parties dispute, however, the scope of the plain and ordinary meaning of “two sub-optics (2*b*) and (2*c*), configured for a simultaneous acquisition of two views according to two different angles.” Thus, we address the parties’ dispute. *See Eon Corp. IP Holdings v. Silver Spring Networks*, 815 F.3d 1314, 1318 (Fed. Cir. 2016) (finding that disputes between the parties over the plain and ordinary meaning of a term need to be resolved as a matter of claim construction).

The gravamen of the parties’ dispute is what “different angles” refers to in the context of this limitation. According to Patent Owner, “different angles” refers to the orientation of the optical axis of each sub-optic. *E.g.*, PO Resp. 5–7. Specifically, Patent Owner argues that the limitation excludes configurations where the sub-optics’ optical axes are spaced in parallel, such as in a conventional stereophotogrammetry device, because the two views would be acquired at the same angle. *E.g., id.* In contrast, Petitioner argues that “different angles” refers to the sub-optics viewing a *subject* from different angles, such as when the sub-optics are spaced apart—parallel configurations are not excluded. *E.g.*, Pet. Reply 1.

We address in detail the parties’ arguments below, starting with the intrinsic evidence.

1. Claim Language

Patent Owner argues that “[t]he claim language does not mention light ‘from the subject’ or ‘object to be imaged,’ much less angles at which light

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is received from different points on a subject/object.” PO Resp. 19 (citing Ex. 2013 ¶ 101). “Rather, the ‘two different angles’ limitation defines an intrinsic characteristic of the sub-optics, *i.e.*, how they are ‘configured’” or angled, according to Patent Owner. *Id.* (citing Ex. 2013 ¶ 100).

We find this argument unavailing. Rather, we agree with Petitioner and determine that the claim language does not mean that the sub-optics are angled but instead means that they each view a subject from different angles. Ex. 1020, 11:43–45; Pet. Reply 7. Specifically, this limitation recites that the two sub-optics are “configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1020, 11:43–45. Notably, “according to two different angles” directly follows “two views,” rather than directly following “configured.” *Id.* And “view” means “[a] scene or an arrangement of subject material for a photograph,” according to a technical dictionary provided by Patent Owner. Ex. 2014,⁶ 210 (defining “view”). In other words, the term “view” itself refers to viewed subject material—a target subject.

We also find unavailing Patent Owner’s argument that “the ‘subject’ is claimed only in connection with the ‘positioning system (34)’ ‘configured to define . . . pre-defined point positions (A3, A4) of the target subject (S).” PO Resp. 19 (citing Ex. 1001, 11:36–40; Ex. 2013 ¶ 102). Again, the term “view” implicates the subject. Ex. 2014, 210.

We also find unavailing Patent Owner’s argument that the claims “disclose configuring the sub-optics according to ‘two different angles’ as a prerequisite to ‘pre-defining’ the ‘positions (A3, A4) of the target subject

⁶ Leslie Stroebe & Hollis N. Todd, *Dictionary of Contemporary Photography* (1974).

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(S),’ as further claimed, and locating the subject at such positions within the two views.” PO Resp. 19–20 (citing Ex. 2013 ¶ 103); *see also id.* at 20 (arguing that dependent claims also support this argument). This argument is inapposite, and does not exclude parallel sub-optics. Rather, as Patent Owner acknowledges, conventional stereophotogrammetry devices can include parallel sub-optics “configured (spaced) to acquire two views,” and provide a stereoscopic binocular area where “the parallel views intersect to form stereo-pairs that can be reconstructed into three-dimensional representations.” PO Resp. 5–6; Ex. 2013 ¶ 67; Ex. 2015,⁷ 90. Hence, positions (A3, A4) can be predefined distances for the target subject S within that stereoscopic binocular area.

We likewise find unavailing Patent Owner’s argument that “the ‘two different angles’ limitation has nothing to do with the angles at which the sub-optics receive light from a subject but rather defines the space within which the subject must be located to be imaged in the first place.” *Id.* at 20 (citing Ex. 2013 ¶ 100); PO Sur-reply 2. This argument also is inapposite, and does not indicate that the claimed sub-optics’ axes are not in parallel, as Patent Owner argues. Rather, the space within which the subject must be located can be the stereoscopic binocular area. Ex. 2015, 90; PO Resp. 4.

We also find unavailing Patent Owner’s argument that because “[d]isplaced sub-optics may be configured to acquire two views at the same angle, or at ‘two different angles,’” “construing ‘two different angles’ to mean any displaced sub-optics would read the ‘two different angles’ limitation out of the claims.” PO Resp. 22 (citing Ex. 2013 ¶ 107); PO Sur-reply 5 (making same argument). Rather, we conclude that “according

⁷ Richard W. Kroon, *3D A-to-Z, An Encyclopedic Dictionary* (2012).

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to two different angles,” in the context of the limitation, is needed to claim a stereophotogrammetry device. Put differently, we agree with Petitioner and conclude that claim 1 does not otherwise recite that the two sub-optics are spaced, such as in a conventional stereophotogrammetry device. Ex. 1001, 11:32–57; Pet. Reply 7 (citing Ex. 1053 ¶ 31).

Although the preamble for claim 1 recites “[a] device for stereophotogrammetry,” “[g]enerally, the preamble does not limit the claims.” Ex. 1001, 11:32–57; *Georgetown Rail Equip. Co. v. Holland L.P.*, 867 F.3d 1229, 1236 (Fed. Cir. 2017) (citation omitted). We also are persuaded by Petitioner’s argument that “the preamble here is not limiting, because the body of the claim provides a complete description of the device.” Pet. Reply 7 (citing *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997)). Hence, “two different angles” is not read out of the claim, but rather serves to claim a stereophotogrammetry device (e.g., by requiring spacing of the sub-optics).

Regardless, as Petitioner notes, no “canon of claim construction is absolute in its application and [] some surplusage may exist in some claims.” Pet. Reply 7 (quoting *Decisioning.com, Inc. v. Federated Dep’t Stores, Inc.*, 527 F.3d 1300, 1312 (Fed. Cir. 2008) (acknowledging that proper construction of “‘remote interface’ arguably renders the term ‘public’ in [a dependent claim] surplusage”)). And we view the phrase “configured for a simultaneous acquisition of two views according to two different angles” as referring to a stereophotogrammetry device, regardless if every word is needed to convey it.

In addition, we find unavailing Patent Owner’s argument that Petitioner makes new arguments concerning viewing the subject from different angles and the preamble not being limiting. PO Sur-reply 1 & n.1.

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Simply put, these arguments from Petitioner involve issues related to claim construction regarding the scope of the plain and ordinary meaning of this limitation and which were raised by Patent Owner in its Response. Petitioner argument is, thus, allowable. *See Consolidated Trial Practice Guide* (November 2019)⁸ (“CTPG”), 45 (“The petitioner may respond to any such new claim construction issues raised by the patent owner.”).

2. The '119 Patent Specification

The parties each argue that the '119 patent Specification supports their arguments for the plain and ordinary meaning of this claim limitation. More specifically, Patent Owner argues that Figures 2–5 support that the sub-optics are oriented to have non-parallel (i.e., inwardly angled) optical axes. *See, e.g.*, PO Resp. 6. Patent Owner illustrates this position by annotating Figure 2 of the '119 patent. PO Resp. 17. We reproduce Patent Owner's annotated figure below.

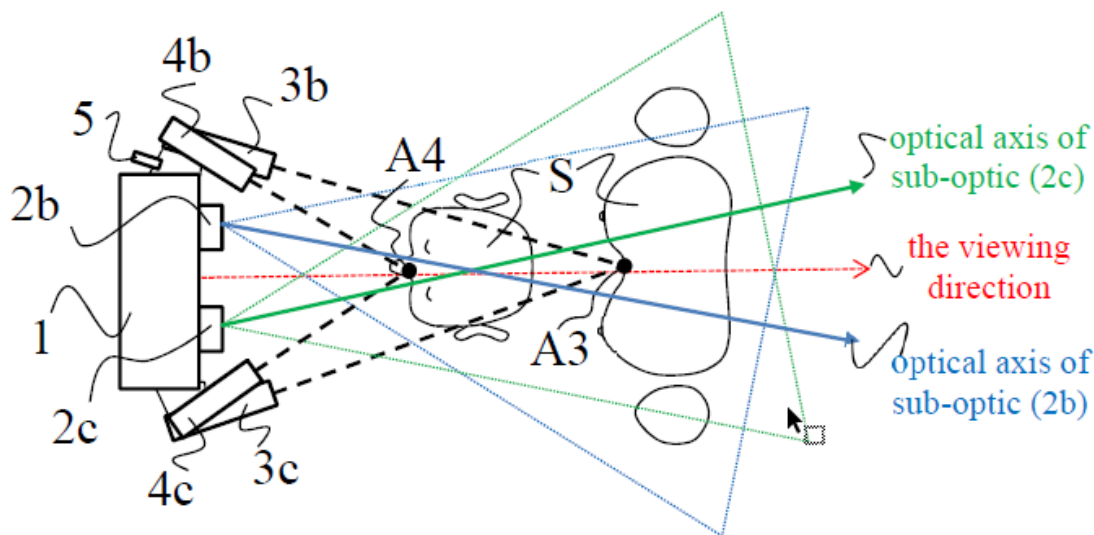


Figure 2 “represent[s] a possible implementation of the device viewed from the top.” Ex. 1001, 3:50–51. Patent Owner annotates Figure 2 by coloring

⁸ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

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the pyramid extending from sub-optic 2b blue and coloring the pyramid extending from sub-optic 2c green. PO Resp. 17. Patent Owner also adds a solid blue arrow and a solid green arrow from each sub-optic to perpendicularly bisect the base of each pyramid, respectively. *Id.* Patent Owner labels each of these arrows as the “optical axis” of the respective sub-optic. *Id.* Patent Owner also adds a dotted arrow from the midpoint between the sub-optics through the centerpoint of an illustraed face and torso, and labels the arrow “the viewing direction.” *Id.*

We agree with Patent Owner that Figures 2–5 illustrate pyramid-shaped views acquired by the sub-optics where the pyramids are inwardly angled (rather than being perpendicular to the device’s plane). Ex. 1001, Figs. 2–5. But the Specification indicates that all of these figures illustrate *possible* or *exemplary* implementations. *See, e.g., id.* at 3:50–54 (stating that Figures 2 and 3 each illustrate a “possible implementation”); 9:26–30 (stating that Figure 4 is an “exemplary device”); 9:34–35 (stating that Figure 5 is an “exemplary device”). Thus, the Specification does not indicate that optical axes of the pyramids are essential to the invention; the Specification never even uses the term “optical axis.” To the contrary, the Specification provides that “[t]he double optics of the stereophotogrammetry device can be manufactured in different ways without impacting the functionality of the invention, provided that it is characterized by an increased depth of field.” *Id.* at 4:25–28.

Moreover, the Specification repeatedly refers to the different angles of the sub-optics relative to the viewed subject in a manner similar to the claims. *See, e.g.,* Ex. 1001, 4:7–14 (referring to “double optics enabling the acquisition of two simultaneous views with different angles *of the subject*”) (emphasis added), 4:20–31 (referring to “double optics” using “secondary

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mirrors each receiving one image *of the subject* with a slightly different angle”) (emphasis added); Pet. Reply 3–5 (citing Ex. 1053 ¶¶ 19–29).

In addition, we find unavailing Patent Owner’s arguments concerning problems described in the Background section of the Specification and the advantages of the ’119 patent. PO Resp. 10–15. For example, the ’119 patent discloses that portable stereophotogrammetry devices previously developed included “a single, nominal distance for picture taking which is optimized either for the face or for breast, but not optimized for both applications at the same time,” according to Patent Owner. PO Resp. 9 (quoting Ex. 1001, 3:10–18; citing Ex. 2013 ¶ 73). Patent Owner argues that the ’119253 patent “ties the ‘two different angles’ limitation to overcoming the problem in the prior art and achieving the advantage of the invention” (i.e., a single stereophotogrammetry device for both distances). *Id.* at 10 (citing Ex. 1001, 3:28–31); *see also id.* (citing Ex. 1001, 4:25–29, 8:24–27; Ex. 2013 ¶ 76) (making same argument).

According to Patent Owner, however, if the sub-optics are configured for parallel views the field of view at point (A4) in Figure 2 “is too small to image the face and would not achieve the ‘advantage of the invention,’ *i.e.*, ‘a single portable stereophotogrammetry system . . . enabling the 3D reconstruction of the head . . . and . . . torso.’” *Id.* at 15 (quoting Ex. 1001, 8:8–15; citing Ex. 2013 ¶¶ 56, 87). This argument is unavailing. Rather, we agree with Petitioner and find that “[s]imply moving the subject further from the camera would place the face” within the view pyramids. *See* Pet. Reply 3–5; Ex. 1053 ¶ 29. As can be seen for the version of Figure 2 modified by Patent Owner to show parallel view pyramids, a sufficient field of view for the face and torso is within the binocular area if the subject is moved further from the camera. *See* PO Resp. 14 (modifying Ex. 1020, Fig. 2); *see also* Ex.

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1053 ¶ 29 (testifying that moving further away “[i]f no other changes were made, . . . would slightly lower the 3D resolution of the surface captured by the device compared to using angled frustrums,” “[h]owever, in this application area a slight decrease in resolution is acceptable”).

In sum, we find that the ’119 Specification does not address optical axes and does not serve to limit the plain and ordinary meaning of this limitation so as to exclude parallel sub-optics.

3. *Prosecution History*

We now turn to the prosecution history the ’119 patent. The prosecution history “can often inform the meaning of the claim language by demonstrating how the inventor understood the invention.” *Phillips*, 415 F.3d at 1317. Such is the case here.

In particular, Patent Owner treated the “according to two different angles” language differently during prosecution than it does now. During prosecution, the Examiner rejected the challenged claims over Hoffmeier⁹ and concluded that Hoffmeier disclosed a stereophotogrammetry device comprising “two sub-optics (2b) and (2c) configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1002, 63–66; Ex. 1053 ¶ 12; Pet. Reply 1–3. Hoffman’s Figure 3 depicts its device and illustrates two views of its subject in Figure 4. Ex. 1005 ¶¶ 25–26; Ex. 1053 ¶ 13. We reproduce these two figures side by side below.

⁹ US 2011/0175987 A1, published July 21, 2011 (Ex. 1005)

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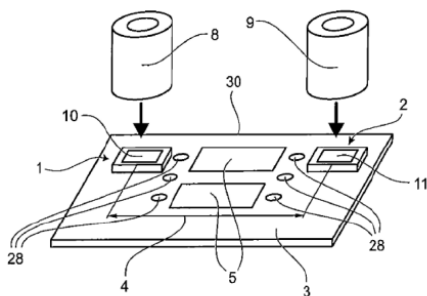


FIG. 3

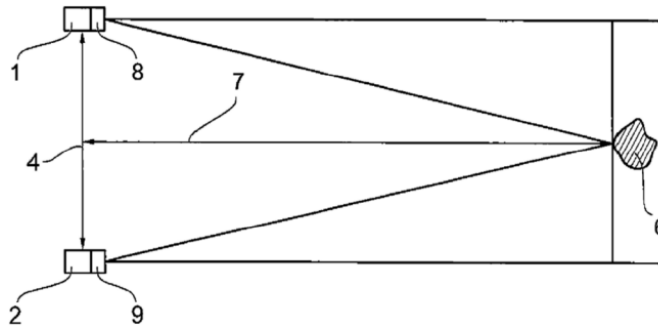


FIG. 4

Ex. 1005, Figs. 3–4. Hoffman’s Figure 3 is a perspective view of the Hoffman system. *Id.* ¶ 25. Hoffman’s Figure 4 “shows a schematic structure of a stereo camera system with the Hoffman stereo camera system board.” *Id.* ¶¶ 10, 26. The evidence supports that Hoffman’s lenses face forward rather than at an angle. *Id.* at Figs. 3–4, ¶ 37 (“The two optical systems 8, 9 can be coupled to the board 3 such that the respective optical axis of an optical system 8, 9 runs through the center point of the image sensing area 10, 11 of an image detection sensor 1, 2”); *see also* Ex. 1053 ¶ 14 (Petitioner’s expert opining that Hoffmeier’s Figure 4 “shows components 8 and 9 as having parallel axes”).

During prosecution, Patent Owner submitted of a statement of its CEO and ’119 patent inventor, Jean-Philippe Thirion, responding to the rejection. Ex. 1002, 88–107; Ex. 2019 ¶ 8. Importantly, in that submission, Patent Owner admitted that Hoffmeier teaches claim 1’s “two different angles” recitation as follows:

Being devoid of any positioning system external to the stereovision system itself makes Hoffmeier quite different from the invention described in ’981 [(referencing the ’981 application that led to the ’119 patent)]. Hoffmeier therefore discloses “*A device for stereophotogrammetry comprising a camera body (1) and a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views*

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according to two different angles” as in claim 1 of ’981, but it is all that Hoffmeier discloses relative to claim 1 of ’981.

Ex. 1002, 92 (bold emphasis added). Patent Owner further admitted that “8 and 9 in FIG 3 of Hoffmeier exactly correspond to 2b and 2c in FIG 2 of [the ’119 patent].” *Id.* at 91–92.

Patent Owner’s admissions during prosecution suggest to the public that Patent Owner understood that spaced optics with parallel optical axes may, nonetheless, fall within the scope of claim 1. Patent Owner now downplays these admissions by arguing that Hoffmeier “is ambiguous as to whether the optical axes of 8, 9 are angled inwards, or are parallel.” PO Sur-reply 8. Although we agree Hoffmeier is ambiguous in this regard, the ambiguity does not help Patent Owner’s position. Rather, despite ambiguity, Patent Owner admitted that Hoffmeier taught “two views according to two different angles.” Ex. 1002, 92. The prosecution history, thus, suggests that Hoffmeier’s optical axes orientation is not important to whether the “two different angles” recitation is met. As such, Patent Owner’s prosecution history statement aligns with the present arguments of Petitioner, not Patent Owner.

4. *Parallel Litigation*

During district court litigation involving the ’119 patent, Patent Owner responded to Petitioner’s invalidity allegations regarding the Plassmann reference by agreeing that Plassmann teaches the now disputed “according to two different angles language”:

QuantifiCare agrees that the quoted language and figure include, *inter alia*, a double-optics comprising two sub-optics configured for a simultaneous acquisition of two views according to two different angles.

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Ex. 1037, 2; *see also* Pet. Reply 6.

Patent Owner now disputes that Plassmann teaches this recitation. *See, e.g.*, PO Resp. 27–30 (arguing that Petitioner’s contention that Plassmann acquires “two views according to two different angles” is incorrect). Thus, Patent Owner’s position in the district court litigation was consistent with its position during prosecution but inconsistent with its position in the current proceeding.¹⁰ Thus, this inconsistency at least somewhat weighs against Patent Owner’s arguments.

In addition, we find unavailing Patent Owner’s argument that its agreement was subject to an objection that Petitioner failed to identify specifically where in Plassmann the limitation was taught. PO Sur-reply 8 (Ex. 1037, 2). Rather, Petitioner identified Plassmann’s Figure 1B and a passage describing it, which is the same structure Petitioner relies on here. Ex. 1037, 2.

In addition, we find unavailing Patent Owner’s argument that this issue was raised belatedly by Petitioner. PO Sur-reply 8. As we discuss above, Petitioner may make this argument because it is responsive to issues of claim construction Patent Owner raises in its Response. CTPG, 45.

5. Summary

In view of the record as a whole, the weight of the evidence supports that claim 1’s “two views according to two different angles” language does not require that the optical axis of each sub-optic be angled differently but

¹⁰ Patent Owner argues that this extrinsic evidence should be disregarded. PO Sur-reply 8–9. We disagree. While the extrinsic evidence is entitled to less weight, it nonetheless bolsters the intrinsic evidence establishing that Patent Owner—outside of the instant proceeding—understood “two views according to two different angles” in accordance with Petitioner’s claim construction.

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instead requires only that the sub-optics view the subject from different angles. Put differently, we conclude that this disputed limitation covers configurations of the two sub-optics that are spaced, regardless of whether the sub-optics' optical axes are orientated in parallel.

C. Principles of Law

“In an [inter partes review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring inter partes review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

A claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time of the invention to a person having ordinary skill in the art. *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of non-obviousness, if present. *See Graham*, 383 U.S. at 17–18. When evaluating a claim for obviousness, we also must “determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

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D. Objective Indicia of Non-Obviousness

Patent Owner argues that considerations of “commercial success, copying, long-felt need, and praise for the invention, further demonstrate non[-]obviousness.” PO Resp. 55–67.

Objective indicia of nonobviousness may include long-felt but unsolved need, failure of others, unexpected results, commercial success, copying, licensing, industry praise, and expert skepticism. *Mintz v. Dietz & Watson, Inc.*, 679 F.3d 1372, 1379 (Fed. Cir. 2012). Objective indicia are only relevant to the obviousness inquiry if there is a nexus between the claimed invention and the objective indicia of nonobviousness. *In re Affinity Labs of Tex., LLC*, 856 F.3d 883, 901 (Fed. Cir. 2017). A rebuttable presumption of nexus applies only “when [a patent owner] shows that the asserted objective evidence is tied to a specific product and that product ‘embodies the claimed features, and is coextensive with [the claims].’” *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (quoting *Polaris Indus. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1072 (Fed. Cir. 2018)). On the other hand, a patent owner is not entitled to a presumption of nexus if the patented invention is only a component of a commercially successful machine or process. *Id.* (reaffirming the importance of the “coextensiveness” requirement).

Applying *Fox Factory*, the Board uses a two-step analysis in evaluating nexus between the claimed invention and objective evidence of nonobviousness, also referred to as secondary considerations. *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 33 at 33 (PTAB Jan. 24, 2020) (precedential). We first consider whether Patent Owner has demonstrated “that its products are coextensive (or nearly coextensive) with the challenged claims,” resulting in a rebuttable presumption of nexus. *Id.* at 33. If not, that

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“does not end the inquiry into secondary considerations”; “the patent owner is still afforded an opportunity to prove nexus by showing that the evidence of secondary considerations is the ‘direct result of the unique characteristics of the claimed invention.’” *Id.* (quoting *Fox Factory*, 944 F.3d at 1373–75). For the reasons discussed below, we find that Patent Owner does not demonstrate (i) that its products are coextensive with the challenged claims for a presumption to attach, and (ii) the requisite nexus with evidence that the secondary considerations are the direct result of the unique characteristics of the claimed invention.

1. Presumption of Nexus

Patent Owner argues that “its LifeViz Infinity (‘Infinity’) product is disclosed and claimed in the patent.” PO Resp. 55 (citing Ex. 2013 ¶ 213). Patent Owner argues that Petitioner “does not dispute this assertion.” *Id.* (citing Pet. 72). Patent Owner thus states that, “Therefore, nexus of secondary considerations regarding the Infinity to the invention is presumed.” *Id.* (citing *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1330 (Fed. Cir. 2016)).

We disagree. Patent Owner does not provide an analysis demonstrating that its Infinity product is coextensive (or nearly coextensive) with the challenged claims. Rather, Patent Owner cites to the following testimony of Dr. van der Weide: “I have reviewed the LifeViz Infinity device and conclude that it embodies the invention of the [’]253 Patent. More specifically, the Infinity possesses all the features listed in claim 1 of the patent.” *Id.* (citing Ex. 2013 ¶ 213). Simply put, Patent Owner fails to provide any analysis whatsoever. *Id.*; *see also* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”).

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Moreover, Patent Owner’s reliance on *WBIP* is misplaced. In that decision, “WBIP presented evidence that specific products . . . [we]re embodiments of the invention as claimed in the asserted claims,” and that provided a basis for finding a presumption of nexus. *WBIP*, 829 F.3d at 1329–31. Such is not the case here.

In sum, Patent Owner does not provide the required analysis demonstrating that Infinity is coextensive (or nearly coextensive) with the challenged claims. PO Resp. 55; *Lectrosonics*, Paper 33 at 33. We, therefore, find that a presumption of nexus is inappropriate.

2. Direct Result of the Unique Characteristics of the Claims

For the second step of our analysis, we look to whether Patent Owner demonstrates the requisite nexus with evidence that any secondary considerations are the direct result of the unique characteristics of the claimed invention. In particular, we address below Patent Owner’s arguments directed to the secondary considerations of (i) commercial success, (ii) copying, (iii) long-felt need, and (iv) praise for the invention. PO Resp. 55–67.

a) Commercial Success

For the commercial success indicia to support nonobviousness, Patent Owner needs “to show both commercial success and that a nexus exists between that success and the merits of the claimed invention.” *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1350 (Fed. Cir. 2012). We start with the latter of these requirements and look to Patent Owner’s arguments that a nexus exists between the purported commercial success and the challenged claims.

First, Patent Owner argues that “[a] nexus between sales of Infinity and the claimed invention is presumed because Infinity ‘is the invention

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disclosed and claimed in the patent.” PO Resp. 61 (citing *WBIP*, 829 F.3d at 1330). We find this argument unavailing because as we find above, Patent Owner does not demonstrate that a presumption should attach. *See supra* Section (V)(A).

We also find unavailing Patent Owner’s argument that “customers have identified claimed features as important to their use of the invention.” PO Resp. 61 (citing PO Resp. 59–60 (arguing that the claimed invention has received praise)). This argument does not address whether any sales, for example, of the Infinity product were owed to the merits of the claimed invention, nor that such purported praise lead to actual demand.

We also find unavailing Patent Owner’s argument that “Infinity sales were due to claimed features of the invention, *e.g.*, its ‘dual-distance’ functionality, which permitted customers to avoid buying multiple products or a non-portable multi-head system to accomplish the same tasks – as was noted by the EuroMediCom press release.” PO Resp. 62 (citing Ex. 2020,¹¹ 4). The announcement identifies the Infinity product as “BEST AESTHETIC DEVICE,” and describes the product, but does not evidence any specific demand for, or sales of, the Infinity product due to any features of the challenged claims. *See* Ex. 2020, 4. Nor does Patent Owner sufficiently address whether dual-distance functionality comprises the unique characteristics of the claimed invention.

We also find unavailing Patent Owner’s argument that “[t]he primary functional difference between [Petitioner’s] H2 and H1 [products] is that H2 can image the body (at a different distance) in addition to the face,” and that

¹¹ *Winners 2018-2019*, EuroMediCom (Jan. 29, 2021) <https://www.euromedicom.com/mca-2018/en/trophy/Winners-2018-2019.html>.

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“[i]t follows that the large differential in production of the H2 as compared to H1 is due to that additional functionality.” PO Resp. 62 (citing Ex. 2034¹² (arguing that Vectra H1 images face only); Ex. 2030¹³ (arguing that Vectra H2 captures a face or body image)). Patent Owner provides no evidence for why this purported differential in production occurred; rather, Patent Owner speculates.

Second, we do not find that Patent Owner demonstrates commercial success of the Infinity product. To establish commercial success, Patent Owner relies on a declaration from its CEO, Dr. Thirion. PO Resp. 61–64 (citing Ex. 2019 ¶¶ 29–37). Although Dr. Thirion provides evidence of increasing sales of Infinity, Dr. Thirion does not give any specific information about unit sales, revenue, or the Infinity’s market share relative to the greater medical imaging market. Ex. 2019 ¶¶ 29–37.

In addition, we find unavailing Patent Owner’s argument that Petitioner “does not contest that its H2 infringes, and thus its sales are relevant to the invention’s commercial success.” PO Sur-reply 25 (citing *Truswal Sys. Corp. v. Hydro-Air Eng’g, Inc.*, 813 F.2d 1207, 1215 (Fed. Cir. 1987) & n. 12 (citing Ex. 2013 ¶¶ 215–219)). We find insufficient support for Patent Owner’s assertion that Petitioner does not contest infringement. And we find Patent Owner’s reliance on *Truswal* misplaced. First, we note that Patent Owner cites to Judge Rich’s dissent in *Truswal*. Second, Judge Rich stated the “once an infringer is sued *and proved to be an infringer*, its sales are appropriately proved and added to the others,” and that “[i]t is necessary to establish that the alleged copies are actual infringements of the patent in

¹² *Vectra H1 Quick Reference Guide*, Canfield (2014).

¹³ *Vectra H2: Capturing a FACE or BODY image*, Canfield.

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suit before they can possibly be relevant and counted as successes *of the patented invention.*” *Truswal*, 813 F.2d at 1215 (Rich, J., dissenting).

Petitioner, as of now, has not been proved to infringe.

In sum, we find that Patent Owner does not show sufficient nexus between the purported commercial success and the claimed invention and fails to show commercial success.

b) Copying

Patent Owner alleges that Petitioner’s Vectra H2 “is a copy of *the invention*, in structure, function, operation, and use.” PO Resp. 64–66 (emphasis added). Patent Owner argues that Petitioner’s the Vectra H2 mimics patented features and Infinity’s use of red and green light beamers. *Id.* at 64. Patent Owner emphasizes that Petitioner launched its H2 device “[e]ighteen months after Quantificare launched its Infinity.” *Id.* Based on these allegations, is unclear whether Patent Owner alleges that Petitioner copied Patent Owner’s patent disclosure, subject matter of Patent Owner’s patent claims, or Patent Owner’s Infinity device.

Petitioner argues that it did not copy Patent Owner’s invention and identifies technical distinctions between the parties’ products. Reply 29–30. Petitioner’s witness, Dr. Otto, credibly opines that Petitioner’s choice of red and green light beamers was made for functional reasons (it is easier to get bright LEDs in red and green than in other colors). *Id.* at 30 (citing Ex. 1053 ¶¶ 80, 81).

Here, Patent Owner lacks evidence that Petitioner copied the ’119 patent or any claim of the ’119 patent. Patent Owner has no evidence, for example, that Petitioner was aware of the ’119 patent during development of the H2 device. Patent Owner further lacks evidence that any particular aspect of the ’119 patent was copied. *In re GPAC Inc.*, 57 F.3d 1573, 1580

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(Fed. Cir. 1995) (“more than the mere fact of copying by an accused infringer is needed to make that action significant to a determination of the obviousness issue”) (citation omitted).

Patent Owner also lacks evidence that Petitioner copied any patented product. As we explain above, Patent Owner lacks evidence that the Infinity is coextensive or nearly coextensive with any challenged claim; the record, thus, does not establish that Infinity is a “patented product” in a relevant sense.

Moreover, our reviewing court has held that “copying requires evidence of efforts to replicate a specific product, which may be demonstrated through internal company documents, direct evidence such as disassembling a patented prototype, photographing its features, and using the photograph as a blueprint to build a replica, or access to the patented product combined with substantial similarity to the patented product.” *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010). Here, Patent Owner lacks evidence that Petitioner studied any Patent Owner product or documents when developing the H2 device. Just to the contrary, the preponderance of the evidence supports that Petitioner’s H2 product differs from Patent Owner’s product because it refocuses at different distances (a design present in prior art systems). Ex. 1053 ¶¶ 79–81; *see also* Reply 29.

Thus, based on the record as a whole, Patent Owner’s allegation of copying is unpersuasive and does not support non-obviousness.

c) Long-Felt Need

Patent Owner argues that there was a long-felt need which the invention of the ’253 patent addresses. PO Resp. 55–59; PO Sur-reply 26. First, Patent Owner argues that in 2007, it “developed and launched the LifeViz stereophotogrammetry camera,” which “was a portable, handheld,

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single camera device with one pair of beamers converging at the focus distance of the camera, and subjects were imaged at that distance.” PO Resp. 57 (citing Ex. 2019 ¶¶ 9–12).

Second, Patent Owner argues that “[a]t the time of invention [of the ’253 patent], there were no portable, ‘all-in-one’ handheld stereophotogrammetry devices for imaging both face and breast/torso.” *Id.* at 58 (citing Ex. 2019 ¶¶ 25–26, 29). “To image both, practitioners had to purchase one device for face and one for breast/torso, or purchase the large, costly multi-head Canfield XT,” which had disadvantages, according to Patent Owner. *Id.* (citing Ex. 2019 ¶¶ 25–26, 29; Ex. 1001, 1:49–52).

Patent Owner argues that “[a]ccordingly, since at least the 2007 introduction of LifeViz, there was a long-felt need for a portable single-camera stereophotogrammetry device that avoided the disadvantages of purchasing multiple devices or a multi-head device like the Canfield XT.” *Id.* at 58–59 (footnote omitted) (citing Ex. 2013 ¶ 212; Ex. 2019 ¶ 30; Ex. 2020, 4). “To address that deficiency, [Patent Owner] developed Infinity in 2015, filed for a patent thereon on October 14, 2015, and began commercial sales one year later,” according to Patent Owner. *Id.* at 59 (citing Ex. 2019 ¶¶ 28–29). Patent Owner argues that its Infinity product satisfied the long-felt need as demonstrated by industry praise and commercial success. *Id.* (citing Ex. 2019 ¶ 30; Ex. 2020, 4). Patent Owner also cites for support Dr. Otto’s deposition testimony that “it ‘was desired to do breast imaging,’ there was ‘a big demand’ to image ‘both areas,[]’ and [Petitioner] ‘didn’t want to have a separate product to do breast imaging.’” PO Sur-reply 26 (citing Ex. 2037, 17:22–18:17).

We find that Patent Owner does not show that there was a long-felt need that the claimed invention addresses. “[L]ong-felt need is analyzed as

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of the date of an articulated identified problem and evidence of efforts to solve that problem.” *Texas Instruments Inc. v. U.S. Int’l Trade Comm’n*, 988 F.2d 1165, 1178 (Fed. Cir. 1993). Patent Owner does not show that the LifeViz product having only one pair of beamers converging at one distance was identified as a problem needing solution in 2007. *See* Ex. 2019 ¶¶ 9–12. Rather, Dr. Thirion testifies to the capabilities of the 2007 LifeViz product. *Id.* That a later generation product, such as Infinity, has additional capabilities does not evidence that a long-felt need existed and was met. Rather, evidence must be provided that shows there was an articulated identified problem and efforts to solve that problem, which Patent Owner does not do. Nor does Patent Owner provide evidence that Infinity was met with skepticism or that persons of ordinary skill in the art tried and failed to achieve the claimed invention.

Nor are we persuaded that industry praise and commercial success alone is sufficient to evidence a long-felt need that the claimed invention addresses. Both can exist without a long-felt need having existed. *See* Ex. 2019 ¶ 30 (testifying that Infinity created a new market for sales, but not providing direct evidence that a long-felt need had existed in the industry); Ex. 2020, 4 (stating that Infinity “is the first portable 3D imaging system capable of capturing face, body, and breast areas thanks to two sets of dual beamer pointers which allow for two distance settings,” but without stating it met a long-felt need). Furthermore, Dr. Otto’s deposition testimony cited by Patent Owner does not evidence that there was a long-felt need that the claimed invention solved. Ex. 2037, 17:22–18:17.

In sum, we find that Patent Owner does not show that there was a long-felt need. Moreover, Patent Owner does not provide analysis to show

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the requisite nexus between the purported long-felt need and the unique characteristics of the claimed invention.

d) Praise

Patent Owner argues that Infinity won a prestigious award, the 2018 EuroMediCom Best Aesthetic Device Award, and that this award establishes industry praise. PO Resp. 59–60. In addition, Patent Owner argues that this award has nexus with the invention. *Id.* To that end, Patent Owner quotes three portions of the EuroMediCom announcement, and argues that “[t]his praise is squarely directed to the claimed invention.” *Id.* at 59–60 (citing Ex. 2020, 4; Ex. 2013 ¶ 214).

Below we produce the entirety of the announcement, and we italicize the portions Patent Owner quotes in its Response.

*The **LifeViz® Infinity** is the first portable 3D imaging system capable of capturing face, body, and breast areas thanks to two sets of dual beamer pointers which allow for two distance settings. This unique system has two acquisition modes. A tripod mounted camera and turntable quickly capture a 360° 3D body image. Eight images are automatically taken and seamlessly stitched to produce a “life-like[”] 3D image of the body for visualization by the physician and patient. In hand-held mode, the camera is capable of generating 3D images of face and breast to simulate procedures and photo-document before/after interventions, without blocking an entire exam room with cumbersome equipment.*

With a simple flip of a switch, dual beam pointers adjust to the distance ideal for face or body applications without the need for cumbersome repositioning and/or multi-headed systems. Superior image quality has been achieved by improving the optic performance. The LifeViz® Infinity produces excellent pictures from both near and far thanks to an increased deep field of view. Finally, a powerful external flash removes the need for specific lighting conditions and additional equipment ensuring reproducible images from one session to the next. The LifeViz® Infinity is comprised of a portable stereovision camera, a

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software suite including an image database, 3D viewer tool, 3D skin analysis, face, breast, and body measurements and simulation modules. All aspects of 3D documentation, comparison, simulation, and measurement ranging from medical to cosmetic applications are possible with this single unique device.

Ex. 2020, 4 (*italics emphases added*). As can be seen above, the announcement broadly describes the Infinity product, including many additional features that Patent Owner does not identify, such as “a tripod mounted camera and turntable”; “[e]ight images are automatically taken and seamlessly stitched to produce a ‘life-like’ 3D image of the body for visualization”; “a powerful external flash”; and “a software suite including an image database, 3D viewer tool, 3D skin analysis, face, breast, and body measurements and simulation modules.” *Id.*

Patent Owner does not show that the purported praise is a direct result of the unique characteristics of the claimed invention. The announcement touts additional features of Patent Owner’s product. Based on the announcement, we cannot assess whether praise for Patent Owner’s product is grounded in a claimed feature, other features, or a combination thereof. Patent Owner does not directly compare the announcement with the challenged claims and does not clearly identify what Patent Owner contends are the unique characteristics of the claimed invention being praised. Moreover, the challenged claims are of varying scope, and Patent Owner does not address those differences.

In addition, Patent Owner argues that three “medical professionals’ praise is directed to the claimed invention.” PO Resp. 60–61 (citing

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Ex. 2021,¹⁴ 11, 19–20). In particular, Patent Owner quotes from Dr. Lee’s testimonial that “[a]lthough regular 2D pictures are inconvenient, capturing a face or body in 3D with the 3D LifeViz® Infinity is easier. First of all, you have a unique device for standardized photography with a switch that adjusts the ideal distance for face and body.” *Id.* at 60 (citing Ex. 2021, 19). Patent Owner does not relate this portion of Dr. Lee’s testimonial to the claims, including failing to show that the purported praise is a direct result of the unique characteristics of the claimed invention.

In addition, Patent Owner quotes from the testimonial of Dr. Karimi who states that Infinity is “a state of the art, easy to use photographic system that has become an essential part of our consultation for face and body procedures.” *Id.* at 61 (citing Ex. 2021, 20). And Patent Owner argues that “Dr. Myriam Fopp uses LV Infinity for face (‘Wrinkles, Pores’) and body,” and Dr. Fopp states that “[w]e also use our LifeViz® Infinity technology for body treatments.” *Id.* (citing Ex. 2021, 11). As above, Patent Owner does not relate these portions of Drs. Karimi’s and Fopp’s testimonials to the claims, including failing to show that the purported praise is a direct result of the unique characteristics of the claimed invention.

In sum, we find that Patent Owner does not show sufficient nexus between the purported praise and the claimed invention.

E. Ground One: Obviousness Based on Plassmann, Treuillet, and Staller

Petitioner asserts that the ’119 patent’s claims 1–4 and 8 would have been obvious over Plassmann, Treuillet, and Staller. Pet. 29–58. We provide

¹⁴ *Testimonials: What our customers say*, QuantifiCare
<https://www.quantificare.com/learn/testimonials/>.

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an overview of Plassmann, Treuillet, and Staller before we address this ground.

1. Plassmann (Ex. 1007)

Plassmann is a World Intellectual Property Organization publication that relates to an apparatus for the production of stereoscopic images. Ex. 1007, at codes (10), (19), (57). Plassmann describes variations of the “MAVIS” system. *Id.* at 12:25–5. Plassmann’s apparatus captures “two images [which are] needed to form a stereo image . . . to produce a three-dimensional representation of the subject.” *Id.* at 12:25–29. The apparatus further includes two light emitting diodes (LEDs) emitting respective beams which converge at a particular distance in front of the apparatus. *Id.* at 12:7–13.

Below, we reproduce Plassmann Figures 1A and 1B.

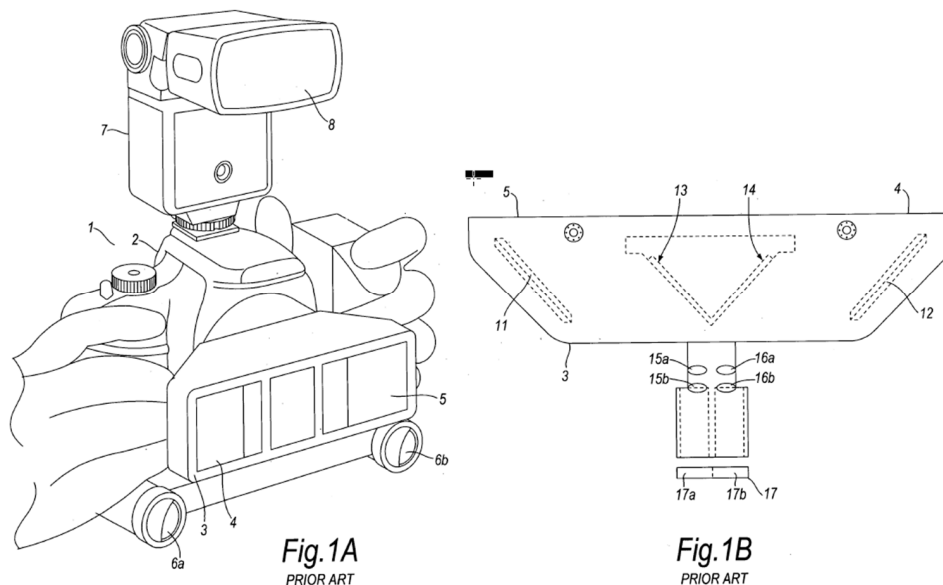


Figure 1A is a perspective representation of an apparatus for obtaining stereoscopic images, showing body 2, e.g., a camera, and adaptor 3. *Id.* at 11:3–4, 11:28–12:4. Further Figure 1B shows a “plan view” of adaptor 3 in further detail. *Id.* at 11:5–6, 12:13–14. Adaptor 3 has two apertures 4, 5

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which respectively collect light which is respectively focused onto charge coupled device parts 17a, 17b, forming respective first and second images. *Id.* at 12:15–25. The first and second images form a stereo image used to produce a three-dimensional representation of a subject. *Id.* at 12:25–29.

Additionally, as shown in Figure 1A, the apparatus includes

two low-powered light emitting diodes (LEDs) 6a, 6b, each provided with a [focusing] lens to produce a beam of light and being arranged so that the beams converge and meet at a point a fixed and desired distance from the apparatus, this distance corresponding to the distance at which the camera lens is [focused].

Id. at 12:8–13. The converging beams act as “a guide to show distance between the apparatus and subject.” *Id.* at 16:12–14.

2. *Treuillet (Ex. 1016)*

Treuillet is a paper that relates to an “approach to build 3-D models of skin wounds from color images.” Ex. 1016, 752. Treuillet explains that “[b]y taking two color images from different points of view, stereophotogrammetry allows the computation of the 3-D coordinates of numerous points on the skin lesion.” *Id.* at 754.

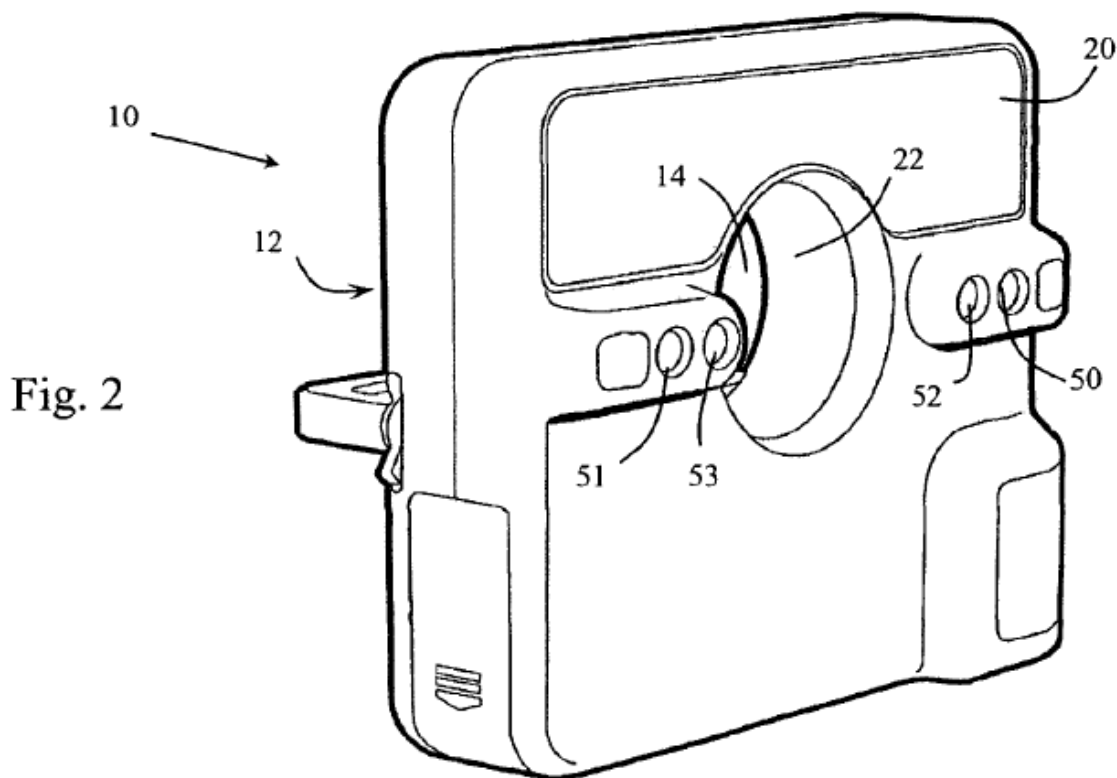
By way of imaging technology background, Treuillet describes the MAVIS II system as “a reflex digital camera equipped with special dual lens optics for recording two images from slightly different viewpoints, generating a stereo pair” which includes “two tube-shaped projectors produce beams of light which intersect in a single spot when the camera is held at the right distance” at “about 80 cm from the wound,” with a tolerance of plus or minus 15 cm. *Id.* at 755.

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3. *Staller (Ex. 1006)*

Staller is a United States patent that relates to a diffuser attachment for a camera including a “distance measurement device [that] uses a pair of light beams which intersect at a repeatable distance from the diffuser body to readily enable positioning of an object to be photographed at that repeatable distance.” Ex. 1006, codes (10), (12), (57).

Below, we reproduce Figure 2, which shows a front perspective view of a diffuser. *Id.* at 3:13–14.



As shown in Figure 2, the diffuser “includes a distance measurement device or indicator in the form of a plurality of light beam emitters 50–53.” *Id.* at 5:13–15. “Each pair of emitters 50–51, 52–53 creates a pair of angled light beams which intersect at different distances in front of diffuser body 12.” *Id.* at 5:17–18. As such, “[e]ach of the pairs of light beams allows diffuser 10 to be relocated at the same repeatable 20 distance from a subject.” *Id.* at 5:18–

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21; *see id.* at Fig. 4. That is, each pair of emitters indicates a different distance. *Id.* at 2:30–35; *see id.* at 5:64–6:2.

Further, either of the emitter pairs, i.e., pair 50–51 or pair 52–53, are selected using a selector switch. *Id.* at 5:38–41. By selecting a particular emitter pair, the distance measurement device indicates a particular distance measurement. *See id.*

4. Discussion

Because Petitioner’s ground requires combining the teachings of Plassmann, Treuillet, and Staller (Pet. 5), we first address motivation to combine. *See KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring “articulated reasoning with some rational underpinning to support the legal conclusion as to obviousness”)). We then address the recitations of each claim that this ground addresses.

a) Reason to Combine

Petitioner relies on Plassmann as teaching most of claim 1’s recitations. For example, Plassmann teaches a stereoscopic adaptor and teaches one pair of light beamers producing intersecting light beams to position a subject within Plassmann’s depth of field. Pet. 17, 34–36; Ex. 1003, Figs. 6a, 6b, ¶ 111. Petitioner does not allege that Plassmann, by itself, discloses claim 1’s recitations regarding two pairs of light beamers converging on two different point positions.

To explain why the two pairs of light beamers recitations nonetheless would have been obvious, Petitioner relies on Treuillet and Staller. Petitioner’s declarant, Dr. Paul Otto, testifies that a person of skill in the art would have understood that the Plassmann device “has a depth of field which contains many distances at which ‘the camera lens is focused.’”

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Ex. 1003 ¶ 113. Petitioner relies on Treuillet to confirm that Plassmann was capable of an expanded depth of field. Pet. 36; Ex. 1003 ¶ 113.

Petitioner persuasively argues that Treuillet teaches that the Plassmann MAVIS II device may take acceptable wound photographs from 65 centimeters to 95 centimeters (within its “depth of field”). Pet. 36; Ex. 1003 ¶ 113; Ex. 1016, 755. A person of skill in the art would have understood that acceptable medical wound photographs would have to be adequately focused and that Treuillet, therefore, suggests a depth of field from 65 centimeters to 95 centimeters for the Plassmann device. Ex. 1003 ¶ 113 (explaining that a person of skill in the art would understand that Plassmann has an expanded depth of field because it can “accurately image a subject at multiple positions”).

Petitioner then relies on Staller as teaching multiple light beamers to define more than one imaging position within a depth of field. Pet. 41–42; Ex. 1006, Fig. 4, 2:29–34, 5:56–6:2. Staller teaches plurality of pairs of light beams that “intersect at a different repeatable distance from the diffuser body.” Pet. 23; Ex. 1006, code (57), 2:29–32, 5:13–15; *see also id.* at 5:56–6:2 (“[T]wo pairs of light beam emitters . . . may be used to provide three or four separate pairs of intersecting bea[m]s and three or four corresponding repeatable distances for diffuser 10.”). In other words, Staller teaches having at least two distinct predefined distance positions for the camera. Ex. 1006, code (57), 2:29–32, 5:13–15, 5:56–6:2. The advantage of the plurality of pairs of light beams is taught by Staller: repeatability. Ex. 1006, 6:10–15 (referring a concern for “repeatable scale” to “improve[] the usefulness of close range photographs for medical” applications).

Petitioner persuasively argues that a person of skill in the art would have been motivated to predefine two distances from a device in order to

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provide for varying levels of magnification. Pet. 45–46. Petitioner persuasively explains that a person of skill in the art would have had a reasonable expectation of success in combining the references’ teachings. *Id.* at 46–47.

Patent Owner argues that a person of ordinary skill in the art would not have “add[ed] beamers converging where Plassmann’s camera is less than optimally focused so as to purposely obtain images of degraded focus and quality.” PO Resp. 31 (citing Ex. 2013 ¶¶ 142, 154–155). Patent Owner first argues that image focus is critical to patient treatment and that a person of skill in the art would understand that a person using Plassmann would want high image quality. *Id.* at 31–33. Patent Owner then argues that, in view of the criticality of image sharpness to wound measurement, a person having ordinary skill in the art would not modify Plassmann to “image at a distance of degraded focus.” *Id.* at 34 (emphasis omitted); *see also* PO Sur-reply 17–20 (making similar arguments that optimal focus to ensure precision and accuracy of the image of a wound).¹⁵ Patent Owner emphasizes that Plassmann refers to “*the* distance at which the camera lens is focused” and that this is a singular distance of optimal focus. *Id.* at 35

¹⁵ Patent Owner refers to Exhibits 2039 and 2040 in its Sur-reply. Patent Owner used these exhibits (which Petitioner served on Patent Owner, but did not file in this proceeding) during a deposition of Dr. Otto, and filed them in this proceeding with its Sur-reply, which is late under our Rules. *See* Paper 41 (Order), 3 (authorizing refiling of exhibits to correct numbering, but stating that “this order does not address the merits of whether or not the exhibits at issue are proper”). We consider these exhibits in evaluating Dr. Otto’s testimony, but “not as evidence supporting [Patent Owner’s] arguments on the merits.” *Ascend Performance Materials Operations LLC, v. Samsung SDI Co.*, IPR2020-00349, Paper 53, at 12 (PTAB. July 15, 2021). Regardless, the disclosures in these exhibits do not change our depth of field analysis.

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(citing Ex. 1007, 12). Patent Owner emphasizes that other art such as Treuillet also refers to a single point of optimal distance. *Id.* at 36–40. Patent Owner’s witness, Dr. van der Weide, testifies that image will degrade if distance moves away from the optimally focused position and that a person of skill in the art would, thus, not modify Plassmann to include additional beamers. Ex. 2013 ¶¶ 146–189.

Patent Owner’s argument is unavailing because stereophotogrammetry devices having depth of field were known in the art. Ex. 1003 ¶¶ 113, 115, 385; Pet. Reply 19; see *Randall Mfg. v. Rea*, 733 F.3d 1355, 1362–63 (Fed. Cir. 2013) (providing that it is appropriate to consider such knowledge as part of an obviousness analysis). For example, Treuillet teaches with respect to the MAVIS II stereophotogrammetry device that “[t]o simplify the image capture, two tube-shaped projectors produce beams of light which intersect in a single spot when the camera is held at the right distance (about 80 cm from the wound),” and that “[e]xact positioning is not required: images can be taken in a volume of ± 15 cm around this point.” Ex. 1016, 755. This teaching supports that exact positioning is not required and that images can be taken within a 30 cm region evidences the depth of field for the MAVIS II. Ex. 1016, 755; Ex. 1053 ¶¶ 55–56.

Similarly, we find unavailing Patent Owner’s argument that Treuillet’s teaching that the beams of light intersect at “the right distance” equates to “the distance of optimal focus or where the image is sharpest,” and limits the MAVIS II to using that distance. PO Resp. 36 (citing Ex. 1016, 755; Ex. 2013 ¶154). This teaching refers to reaching the pre-defined distance, rather than limiting the depth of field. Ex. 1016, 755. We also find unavailing Patent Owner’s arguments that Treuillet teaching that “images can be taken in a volume of ± 15 cm” does not teach a depth of field, and

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that “[c]an’ is not ‘should.’” PO Resp. 41–42 (citing Ex. 2013 ¶¶ 180–182). The references’ teachings correspond to what depth of field means and “can” expresses that capability of taking focused images within the depth of field. Ex. 1016, 755; Ex. 1003 ¶ 37; Ex. 2006 ¶ 47; Ex. 1001, 6:15–16; Ex. 1020, 4:20–24.

In addition, Hoeffelin¹⁶ teaches a stereophotogrammetry device having a 40 cm depth of field, which is sufficient to image both the face and torso. *See* Ex. 1015, 8–9 (disclosing “that the focal length needs to be respected (between 80 and 120 cm)”; Ex. 1003 ¶ 169; Ex. 1053 ¶ 61. We find unavailing Patent Owner’s argument that Hoeffelin teaches that “the focal length needs to be respected,” or otherwise brings risk of distortion. PO Resp. 36–37 (citing Ex. 1015, 8–9; Ex. 2013 ¶ 156). Patent Owner ignores the “(between 80 and 120 cm)” range that immediately follows and modifies the focal length statement, and expresses a depth of field. Ex. 1015, 8–9.

Moreover, we find unavailing Patent Owner’s arguments to the extent that they focus only on Plassmann’s depth of field. *See* PO Resp. 31–36; PO Sur-reply 17–20. These arguments are directed to Plassmann’s teachings individually, which is the incorrect focus. *Cf. In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (“Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references”); *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). In addition, these arguments are akin to arguing that Plassmann and Treuillet’s teachings cannot be physically combined, which

¹⁶ H. Hoeffelin, et al., *A Methodological Evaluation of Volumetric Measurement Techniques including Three-Dimensional Imaging in Breast Surgery*, BioMed Research Int’l, vol. 2014, 8 (Jan. 2014) (Ex. 1015).

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is an improper focus for determining non-obvious. *See Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (quoting *In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983)); *see also id.* (quoting *In re Etter*, 756 F.2d 852, 859 (Fed. Cir. 1985) (en banc)) (“Etter’s assertions that Azure cannot be incorporated in Ambrosio are basically irrelevant, the criterion being not whether the references could be physically combined but whether the claimed inventions are rendered obvious by the teachings of the prior art as a whole.”).

We also find unavailing Patent Owner’s argument that that there would be no reason to combine Staller’s teachings with Plassmann because Plassmann has no need for additional beamers to provide repeatable scale. PO Resp. 38–40. More specifically, Patent Owner argues that “with Plassmann, the scale of the 3D reconstruction is already known exactly from the calibration and triangulation methodology,” and “[t]herefore, Plassmann already enables wound images to be viewed over successive examinations at repeatable scale(s) and at varying levels of magnification.” *Id.* (citing Ex. 2013 ¶ 165). Even if, as Patent Owner argues, one of ordinary skill in the art could develop or utilize different solutions to address scale, this does not make Staller’s solution less obvious. *Cf. Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (“[A] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.”). Moreover, the ability to consistently take images from different positions using multiple beamers would still have utility.

We also find unavailing Patent Owner’s argument that “Treuillet criticizes MAVIS II, calling it ‘cumbersome’ and stating ‘all the previous systems are unsuitable for general use in clinical settings.’” PO Resp. 43–44

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(quoting Ex. 1016, 752, 755, 761). Patent Owner further argues that Treuillet criticizes that Plassmann's MAVIS II requires "careful calibration." *Id.* at 44. These arguments, however, do not undermine our finding above that a person having ordinary skill in the art would have understood that the MAVIS II device had a useable depth of field and that Plassmann would benefit from having multiple positioning beamers within that depth of field. Treuillet does not denigrate the notion of using multiple beamers with MAVIS II. *Cf. In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004) ("The prior art's mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the [claimed solution].").

We also find unavailing Patent Owner's argument that the "MAVIS II" device that Treuillet describes is not the same as the "MAVIS" device Plassmann refers to. PO Resp. 41. The preponderance of the evidence supports that a person of ordinary skill in the art would have understood that a "MAVIS" device of the Plassmann reference, regardless of whether or not it was precisely the same as MAVIS II, would have had the same depth of field (or, at a very minimum, some usable depth of field). In particular, Dr. Plassmann referred to MAVIS as also having a 30 centimeter depth of field. Exhibit 2040 (originally marked Exhibit 1048 during deposition) is an article by Dr. Plassmann entitled "Accuracy and Precision of the Hand-Held MAVIS Wound Measurement Device." In that article, Dr. Plassmann explains that the MAVIS includes a projector that "produces two beams of light that intersect at the centre of the middle of the field of view and in halfway in the field of depth (approximately 80 cm in front of the camera)." Ex. 2040, 3; *see also* Ex. 1054, 120:9–12 (inventor, Dr. Thirion, testifying that he saw the Exhibit 2040 article before filing the application leading to

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the '119 patent). Also, the '119 patent's inventor, Dr. Thirion, acknowledged that the device from the Plassmann reference resemble[d] the MAVIS II system." Ex. 1054, 85:19–88:1. Dr. Otto also testifies that a person of ordinary skill in the art would have understood that the Plassmann article refers to the "MAVIS II" device when using the term "MAVIS." Ex. 1003 ¶ 114.

Patent Owner does not persuasively dispute that Plassmann's device would have some depth of field. Rather, Patent Owner's witness, Dr. van der Weide, admits that every stereophotogrammetry device has some depth of field. Ex. 2006 ¶ 78 ("[A] stereophotogrammetry device does not have zero depth of field."); *see also* Ex. 1054, 119:11–16 (the '119 patent's inventor, Dr. Thirion, stating that "every camera has a depth of field"). Patent Owner also does not present persuasive evidence disputing that a person of skill in the art would have understood that the Plassmann's MAVIS device would have the depth of field described in Treuillet.

Thus, in light of the above, we find that one of ordinary skill in the art would have found it obvious to modify Plassmann's stereophotogrammetry device, based on what was known in the art, to have multiple predefined distance positions for repeatability. Plassmann already teaches use of one pair of light beams for positioning, and a person of skill in the art would have understood that the Plassmann device could benefit from multiple pairs of light beams in the same way the Staller device benefits from the multiple pairs of light beams to enable positioning at more than one repeatable distance from the camera. Ex. 1003 ¶¶ 138–139. As the Supreme Court has explained:

[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would

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improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill, . . . [A] court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.

KSR, 550 U.S. at 417 (emphasis added).

c) Claim 1

We next address obviousness of each claim recitation starting with claim 1.

The preamble of claim 1 recites “[a] device for stereophotogrammetry comprising.” For purposes of our analysis, we do not need to decide whether or not this preamble is limiting. Even if the preamble were limiting, the preponderance of the evidence supports that Plassmann discloses a device for stereophotogrammetry. Pet. 30–31; Ex. 1007, Figs. 1A, 1B, 12:25–29; Ex. 1003 ¶ 103. Patent Owner does not persuasively dispute this recitation.

Claim 1 next recites “a camera body.” As Petitioner argues, the preponderance of the evidence supports that Plassmann discloses a camera body. Pet. 31; Ex. 1007, Fig. 1A, 5:29–30, 12:3–4; Ex. 1003 ¶ 105. Petitioner adds that Plassmann teaches using “a camera body such as is well-known to those skilled in the art.” *Id.* at 30 (quoting Ex. 1007, 5:29–30, 12:3–4). Patent Owner does not persuasively dispute this recitation.

Claim 1 next recites “a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views according to two different angles.” Pet. 32–34 (citing Ex. 1007, 21:14–25, Fig. 1B; Ex. 1003 ¶¶ 107–110). As Petitioner argues, the preponderance of the evidence supports that Plassman teaches this recitation.

Petitioner annotates Plassmann’s Figure 1B, which we reproduce below with Petitioner’s annotations. Pet. 33.

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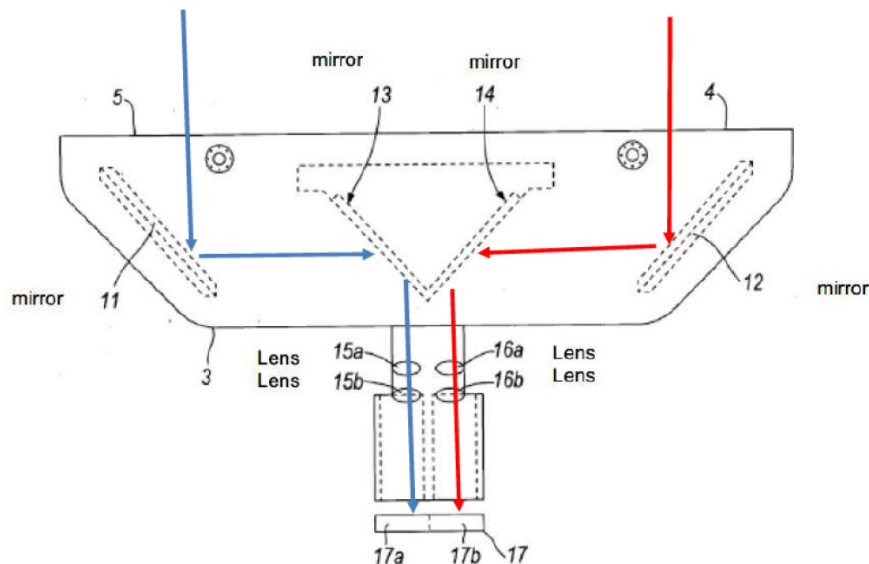


Fig. 1B
 PRIOR ART

Plassmann’s Figure 1B depicts a plan view of an adaptor used with the MAVIS apparatus. Ex. 1007, 11:5–6, 11:25–12:29. Petitioner annotates Figure 1B with red and blue lines to illustrate that Plassmann “comprises double-optics employing two sets of sub-optics (i.e.,] 11, 13, 15a, and 15b (blue) and 12, 14, 16a, and 16b (red)).” Pet. 34.

Petitioner persuasively argues that “Plassmann’s Figure 1B is substantially identical to the ’119 patent’s figures depicting the claimed double optics and two sub-optics.” Pet. 33–34 (citing Ex. 1007, Fig. 6; Ex. 1003 ¶¶ 108–109). Petitioner argues that Plassmann teaches, for example, that light forming the first image (depicted by blue annotations) hits the adaptor, hits mirror 11 and then mirror 13 before passing through lenses (15a,b). *Id.* at 20–21 (citing Ex. 1007, 12:14–22; Ex. 1003 ¶ 78). According to Petitioner, one of ordinary skill in the art “would recognize that the combination of mirrors and lenses traversed by each light path in Plassmann . . . comprises double-optics employing two sets of sub-optics (*i.e.* 11, 13,

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15a, and 15b (blue) and 12, 14, 16a, and 16b (red)) as recited.” *Id.* at 34 (citing Ex. 1003 ¶ 109). Petitioner adds that “because of the spaced mirrors 11 and 12, the two images are necessarily taken at different angles.” *Id.* In addition, Petitioner argues that “[b]ecause the images are captured using a single camera . . . [one of ordinary skill in the art] would understand that they are obtained simultaneously.” *Id.*

We agree with Petitioner and find that one of ordinary skill in the art would have recognized that the combination of mirror and lenses comprises double-optics employing two sets of sub-optics (*i.e.* 11, 13, 15a, and 15b (blue) and 12, 14, 16a, and 16b (red)). Ex. 1007, 12:14–25, Fig. 1B; Ex. 1003 ¶ 235; Pet. 32. More specifically, we agree with Petitioner and find that Plassmann teaches having two sub-optics, which are displaced from one another, and which each collect light from the subject to be imaged (viewed). *See, e.g.*, Ex. 1007, 12:14–25, Fig. 1B. Plassmann teaches that the light collected by each sub-optic comprises the light that passes through the respective aperture 4 or 5, and traverses different sets of mirrors and lenses to be focused on a different part of a charged coupled device to form respective first and second images (views). *Id.* at 12:14–25, Fig. 1B.

We also agree with Petitioner and find that due to spaced mirrors 11 and 12—which are part of different light paths and which are hit by the light that passes through their respective aperture 4 or 5—the two images (views) are necessarily acquired at different angles. Ex. 1007, 12:14–25, Fig. 1B; Ex. 1003 ¶ 235; Pet. 32. Moreover, each sub-optic receives light from, for example, the center point of the object to be imaged from a different angle due to the spaced mirrors 11 and 12, as well as depending on the curvature of the subject and which point on the subject from which the light originates. *Id.*; *see also* PO Resp. 28 (admitting that “[i]t is true that, when a subject is

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imaged using a stereophotogrammetry device having two sub-optics, the ‘angle’ between a point of the subject and each sub-optic is different”).

In addition, the ’119 patent Specification describes the claimed double optics as follows: “A double optics (2) adapted to the camera body (1) and composed of two sub-optics (2b) and (2c), enabling the acquisition of a stereo pair corresponding to two slightly different viewing angles.”

Ex. 1001, 8:24–27. Notably, the passage provides that having two sub-optics enables acquiring a stereo pair “corresponding to two slightly different viewing angles,” without addressing the sub-optics’ orientation. *Id.*

Lastly, we agree with Petitioner and find that because images (views) are captured using a single camera, one of ordinary skill in the art would have understood they are obtained simultaneously. Ex. 1003 ¶ 235.

We find unavailing Patent Owner’s arguments disputing that Plassmann teaches this limitation. PO Resp. 23–30. Patent Owner’s arguments are premised on its construction (which we do not adopt) of the plain and ordinary meaning for this limitation which excludes parallel view sub-optic configurations. *Id.* Put differently, Patent Owner argues that having the sub-optics spaced apart from each other is insufficient to teach “two views according to two different angles.” *Id.* As we discuss above, this is incorrect. Thus, Patent Owner’s discussions regarding the optical axes of the sub-optics and their orientations are inapposite in light of the proper construction for “two views according to two different angles.” *Id.*

Moreover, we afford the testimony of Dr. van der Weide, Patent Owner’s declarant, little weight with regard to this issue, as it is based on the incorrect claim construction for “according to two different angles,” and

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does not explain otherwise a basis for the testimony that the two images are acquired at the same angle. Ex. 2013 ¶¶ 113–141.¹⁷

In sum, we are persuaded that Petitioner demonstrates by a preponderance of the evidence that Plassmann teaches “a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views according to two different angles.”

Claim 1 next recites “wherein the device is comprising a positioning system (34) configured to define a position of a target subject (S) for one of at least two distinct pre-defined point positions (A3, A4) of the target subject (S) relative to the stereophotogrammetry device.” Ex. 1001, 11:32–57. As Petitioner argues, the preponderance of the evidence supports that the combination of Plassmann, Treuillet, and Staller teaches or suggests this limitation and, as we explain above, the evidence supports that a person of ordinary skill in the art would have had reason to combine these references’ teachings to meet this limitation with a reasonable expectation success. Pet. 34–40.

First, as Petitioner argues, the preponderance of the evidence supports that Plassmann teaches a positioning system that uses a pair of light beamers to signal when a target subject is reaching a predefined distance position to the camera. *See* Ex. 1007, Fig. 1A (light beamers 6a, 6b); Pet. 34–35. Plassmann teaches that these light beams converge at a predefined distance

¹⁷ Petitioner argues that Plassmann and its Figure 3A suggest that its sub-optics are angled inwardly such that this recitation would be met “[e]ven if the Board were to exclude parallel suboptics from the claims.” Pet. Reply 8. It is not necessary to reach this issue because we did not adopt Patent Owner’s construction.

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“corresponding to the distance at which the camera lens is focused.”

Ex. 1007, 12:7–13. More specifically, Plassmann states the following:

The apparatus is also provided with two low-powered light emitting diodes (LEDs) 6a, 6b, each provided with a focussing lens to produce a beam of light and being arranged so that the beams converge and meet at a point a fixed and desired distance from the apparatus, this distance corresponding to the distance at which the camera lens is focussed.

Id.; Pet. 34–35. Accordingly, we find that Plassmann teaches the limitation, save for having a second predefined distance position—if there are two different distance positions, one necessarily is closer to the camera body and the other one farther. Ex. 1007, 12:7–13, Fig. 1A.

Second, as Petitioner argues, a preponderance of the evidence supports that Staller teaches a positioning system having more than one predefined imaging distance position. Pet. 41–42. More specifically, we find that Staller teaches a strobe diffuser attachment for a camera, which includes a “distance measurement device [that] may be adapted to selectively produce one of a plurality of pairs of light beams which intersect at different repeatable distances from the diffuser body.” Ex. 1006, code (57), 2:29–32, 5:13–15; *see also id.* at 5:56–6:2 (“[T]wo pairs of light beam emitters . . . may be used to provide three or four separate pairs of intersecting bea[m]s and three or four corresponding repeatable distances for diffuser 10.”); Pet. 38. In other words, Staller teaches having at least two distinct predefined distance positions for the camera. Ex. 1006, code (57), 2:29–32, 5:13–15, 5:56–6:2.

We also find that Staller teaches that its “distance indicator improves the usefulness of close range photography by providing a repeatable scale to photographs[, which] . . . improves the usefulness of close ranges

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photographs for medical and other organic growth measurement applications.” Ex. 1006, 6:10–15. Plassmann also teaches that “[s]tereoscopic imaging has been known for many years,” and “ha[s] been used to measure the shape of wounds and the like which are otherwise difficult to measure by conventional techniques.” Ex. 1007, 1:6–15. We find that it was known in the art before the ’253 patent to use a camera having multiple predefined distances for imaging a subject in connection with wound or lesion treatment. *See* Ex. 1017,¹⁸ 579; Ex. 1011,¹⁹ 164, Fig. 2, Table 2; Ex. 1008,²⁰ 481.

Based on the record as a whole and as we explain when addressing reasons to combine, *supra* Sec. V.F.4.a, we determine that Petitioner has adequately established that a person of skill in the art would have had reason to modify Plassmann to include predefined distances as suggested by the combined teachings of Plassmann, Treuillet, and Staller.

Claim 1 next recites “wherein the device comprises a switch (5) comprising a first selection position configured to select the farther point position (A3) and a second selection position configured to select the closer point position (A4).” As Petitioner argues, a preponderance of the evidence supports that Staller teaches such a switch. Ex. 1006, Fig. 1, 5:38–43; Ex. 1003 ¶¶ 131–133; Pet. 43–44. Patent Owner does not persuasively dispute this point.

¹⁸ Gwen Clarke, *Recording Wounds: Polaroids New Medically Designed Camera*, British Journal of Community Nursing, vol. 5, no. 11 (Sept. 27, 2013) (“Clarke”).

¹⁹ Melvin A. Shiffman, *A New Camera for Cosmetic Surgery*, The Am. J. Cosmetic Surgery, vol. 15, no. 2 (June 1, 1998) (“Shiffman”).

²⁰ Clare Williams, *Wound care assessment with the Polaroid Macro 3 SLR*, British J. Community Nursing, vol. 6, no. 9 (2001) (“Williams”).

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Claim 1 next recites “wherein the switch (5) is configured to switch on the first pair of light beamers (3*b*, 3*c*) in the first selection position and wherein the switch (5) is configured to switch on the second pair of light beamers (4*b*, 4*c*) in the second selection position.” As Petitioner argues, a preponderance of the evidence supports Staller teaches such a switch. Ex. 1006, Fig. 1, 5:38–43; Ex. 1003 ¶¶ 131–136; Pet. 44–45. Patent Owner does not persuasively dispute this point.

In summary, we determine that Petitioner shows by a preponderance of the evidence that claim 1 would have been obvious to one of ordinary skill in the art in view of the combination of Plassmann, Treuillet, and Staller.

c) Claim 2

Claim 2 recites “[t]he device according to claim 1 wherein the at least two distinct pre-defined positions (A3, A4) are included in a space region corresponding to a depth of field (6) of the double-optics (2).” Ex. 1001, 11:58–61. As Petitioner argues, the preponderance of the evidence supports that a person having ordinary skill in the art would have reason to ensure that each predefined position falls within Plassmann’s depth of field to obtain focused images. Ex. 1003 ¶¶ 145–146; Pet. 47. Patent Owner does not persuasively dispute this point.

d) Claim 3

Claim 3 recites “[t]he device according to claim 1 wherein the closer point position (A4) and the farther point position (A3) are such that a surface of a field of view corresponding to the farthest point position (A3) is at least 25% larger than a surface of a field of view corresponding to the closer point position (A4).” Ex. 1001, 11:62–67. To address this recitation, Petitioner

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argues that it would have been obvious to a person having ordinary skill in the art to define a farther position 25% larger than the closer position. Pet. 49. Petitioner persuasively argues that Plassmann and Treuillet both disclose that Plassmann could be used for wound monitoring. *Id.* Petitioner also persuasively argues that a person of ordinary skill in the art would have understood that wound-monitoring devices could employ close and far positions which differ in magnification by more than 200%. *Id.* A preponderance of the evidence including the Clark reference evidences this point. Ex. 1017; Ex. 1003 ¶ 153.

Petitioner further argues a person having ordinary skill in the art would have also understood that a Plassmann-type stereophotogrammetry device could be used for imaging face or breasts. Pet. 50. A preponderance of the evidence also supports this position. The '119 patent acknowledges that stereophotogrammetry devices had been used for 3D reconstructions of face and breasts in A3 and A4 surface format. Ex. 1001, 1:41–48; Ex. 1003 ¶¶ 154–155. Note, however, that the '119 patent states that specialists use “two distinct stereophotogrammetry cameras” for acquiring 3D representation of faces or breasts. Ex. 1001, 1:49–52.

Petitioner’s witness, Dr. Otto, calculates that Plassmann’s 30-centimeter depth of field would be sufficient to encompass a “surface field of view” equivalent to the A4 format and equivalent to the A3 format (different by more than 25%). Pet. 50–51 (citing Ex. 1003 ¶¶ 156–157). Dr. Otto also testifies that, while Plassmann and Treuillet do not disclose focal length of the Plassmann device’s lenses, a person having ordinary skill in the art would understand that different lenses could be employed to achieve different results. Pet. 51 (citing Ex. 1003 ¶¶ 158–166). Dr. Otto further explains that a person of ordinary skill could configure a Plassmann

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device to take both A3 and A4 formats within the depth of field of the Plassmann device. *Id.* Dr. Otto further explains that a person of ordinary skill would understand that any suitable lens could be used to achieve imaging goals. *Id.* at 51–52, 54 (citing Ex. 1003 ¶¶ 167, 172–173).

Petitioner further argues that a person having ordinary skill in the art would have known that similar stereophotogrammetry devices could image face and bodies, such as the LifeViz II device. Pet. 52–53; Ex. 1014, 2 (depicting images of faces and breasts using LifeViz II); Ex. 1003 ¶ 168. Petitioner argues that Hoefflin teaches that LifeViz II has a depth of field from 80–120 cm and that a person of ordinary skill in the art would have thus understood that a 40-centimeter depth of field would be sufficient to encompass A4 format and 100% larger A3 format. Pet. 53 (citing Ex. 1003 ¶¶ 169–170; Ex. 1015, 8–9). Dr. Otto confirmed that such a device could encompass these formats. *Id.* (citing Ex. 1003 ¶ 171).

Patent Owner argues that Dr. Otto’s analysis and conclusions are flawed. PO Resp. 46. Patent Owner argues, as Petitioner acknowledged, that neither Plassmann nor Treuillet disclose actual focal length of the lenses, and Patent Owner argues that this means neither references teaches “field of view.” *Id.* (citing Ex. 2013 ¶¶ 102–193; Ex. 1003 ¶ 158). Patent Owner, thus, emphasizes that Dr. Otto relies on replacing Plassmann’s lenses to reach A4 and A3 formats. *Id.* at 47.

Patent Owner then argues that Dr. Otto’s calculations and approach err because they are based on a single pyramidal view rather than considering, as is necessary for stereophotogrammetry, the intersection of two separate view frustums. *Id.* at 48. Patent Owner’s witness, Dr. van der Weide, explains this error. Ex. 2013 ¶¶ 196–199. Patent Owner further argues that depth of field is controlled by lens aperture and that Dr. Otto

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could not evaluate Plassmann's depth of field without lens aperture dimensions. PO Resp. 49–50 (citing Ex. 2013 ¶ 200).

Patent Owner also argues that, even under Dr. Otto's calculations, the subject would have to be imaged 64.5 cm from the camera which is outside of the 65–95 cm depth of field Dr. Otto calculates. *Id.* at 50 (citing Ex. 1003 ¶ 157; Ex. 2013 ¶ 201).

Patent Owner also disputes that Petitioner and Dr. Otto incorrectly contend that LifeViz II could image the face and torso. Patent Owner emphasizes that the face image is from a QuantifiCare advertisement while the torso image is from Hoefflin, which used a different camera. *Id.* at 51–53 (citing Ex. 1014, 1–2; Ex. 1015, 2, 3, 4); Ex. 2013 ¶¶ 204–205; Ex. 2019 ¶¶ 20, 23–24). Patent Owner further argues that Hoefflin only provides focal length rather than depth of field. PO Resp. 53 (citing Ex. 1005, 8–9; Ex. 1015, 4; Ex. 2013 ¶ 296). Patent Owner also argues that Polaroid's Macro SLR 3 and 5 used different lenses with different focus distances to achieve different magnification. *Id.* at 53–54 (citing Ex. 2013 ¶¶ 207–208).

Patent Owner then argues that, because of Dr. Otto's analytic errors, Petitioner has not shown that modified devices would meet claim 3 or that a person having ordinary skill in the art could determine how to modify the devices with a reasonable expectation of success. PO Resp. 54.

Considering all of the evidence before us, the preponderance of the evidence supports that a person having ordinary skill in the art would have had reason to configure Plassmann as claim 3 recites (to be able to take both face and breast stereo-photos) and would have understood that suitable lenses and focus distance could be employed to achieve claim 3's field of view. We find Dr. Otto's testimony credible and Petitioner's position persuasive based on the evidence the Petition cites.

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In particular, the preponderance of the evidence suggests that a person of skill in the art would have known the benefit of creating stereophotogrammetric 3-D images of both faces and breasts. *See* Ex. 1001, 1:41–48 (admitting known desire to create images of faces and breasts); Ex. 1014, 2 (suggesting that LifeViz device can create 3-D face image); Ex. 1015, 3 (suggesting LifeViz device can create 3-D breast images). The preponderance of the evidence further supports that a person having ordinary skill in the art would have known that the device described by Plassmann and Treuillet could be configured to create these images with a reasonable expectation of success by making use of various lenses, focal lengths, depth of field, and so forth to define closer and farther imaging positions as desired and, in particular, to reach the recitations of claim 3 for face and breast imaging. Pet. 54; Ex. 1003 ¶ 172; Ex. 1053 ¶¶ 69–74.

Patent Owner’s arguments that Petitioner’s witness, Dr. Otto, miscalculates the precise adjustments that would allow such imaging (PO Resp. 46–53) do not undermine Petitioner’s rationale as to why a person having ordinary skill in the art would combine the references’ teachings to reach claim 3 or would have reasonable expectation of success reaching claim 3. As Petitioner points out, Patent Owner lacks evidence that would undermine Petitioner’s position that such a device would have been desired and achieving such a device would have been within ordinary skill in the art. Reply 21. Thus, the preponderance of evidence as to this more general proposition remains true even if Patent Owner were correct that Dr. Otto’s precise calculations were in error. Petitioner does not have a burden to provide precise dimensions of an obvious device within the scope of claim 3. Rather, Petitioner needs to show that a person having ordinary skill in the art would have had both a reason to combine and reasonable expectation of

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success as to reaching claim 3's recitations. As we explain above, Petitioner meets this burden.

In sum, we find that Petitioner demonstrates by a preponderance of the evidence that claim 10 would have been obvious to one of ordinary skill in the art over Plassmann, Treuillet, and Staller.

e) Claim 4

Claim 4 recites:

The device according to claim 3 wherein the field of view corresponding to the closer point position (A4) is equal to a normalized surface format A4, that is 21 cm times 29.7 cm, with possible variations of plus or minus 40% of a surface of the normalized surface format A4 and the field of view corresponding to the farther point position (A3) is equal to a normalized surface format A3, that is 29.7 cm times 42 cm, with possible variation of plus or minus 40% of a surface of the normalized surface format A3.

Ex. 1001, 12:1–9. For largely the same reasons as claim 3, Petitioner argues that it would have been obvious to a person having ordinary skill in the art to select a field of view that corresponds to A3 surface format and a second field that corresponds to A4. Pet. 54–55. Patent Owner argues that Petitioner does not meet its burden for the same reasons as claim 3. PO Resp. 54–55. As we explain above, the preponderance of the evidence supports Petitioner's position. *See also* Ex. 1003 ¶¶ 176–178 (Dr. Otto addressing claim 4).

f) Claim 8

Claim 8 first recites “[a] method comprising using the stereophotogrammetry device according to claim 1 comprising.” Ex. 1001, 12:31–32. As explained above, the combined teachings of Plassmann, Treuillet, and Staller disclose each recitation of claim 1. As explained below,

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Petitioner also adequately establishes that the references disclose all steps of the method of using the claim 1 device. Pet. 56.

Claim 8 next recites “activating the switch (5) of the positioning system (34) to select one out of the at least two distinct point positions (100).” Ex. 1001, 12:33–35. As we explain above and as Petitioner argues, the preponderance of the evidence supports that Staller discloses such a switch. A person of ordinary skill in the art would also understand that Staller suggests activating the switch. Pet. 56; Ex. 1003 ¶ 182. Patent Owner does not persuasively dispute this point.

Claim 8 next recites “switching on the first pair of light beamers (3*b*, 3*c*) if the first selection position configured to select the farther point position (A3) is selected or switching on the second pair of light beamers (4*b*, 4*c*) if the second selection position configured to select the closer point position (A4) is selected.” Ex. 1001, 12:42–44. As we explain above and as Petitioner argues, the preponderance of the evidence supports that Staller discloses such a switch. A person of ordinary skill in the art would also understand that Staller suggests activating the switch. Pet. 56; Ex. 1003 ¶ 184. Patent Owner does not persuasively dispute this point.

Claim 8 next recites “moving the stereophotogrammetry device and/or the target subject (S) so that the target subject (S) is at that selected pre-defined point position (200).” Ex. 1001, 12:42–44. As explained above and as Petitioner argues, the preponderance of the evidence supports that Plassmann and Treuillet disclose a positioning system configured to allow the device “to be relocated at the same repeatable distance from a subject as demonstrated in FIG. 4.” Ex. 1006, 5:19–21; Pet. 57; *see also* Ex. 1003 ¶¶ 186–188. Patent Owner does not persuasively dispute this point.

Claim 8 next recites “taking one or several stereo-pairs at that selected

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predefined point position (300).” Ex. 1001, 12:45–46. As explained above and as Petitioner argues, the preponderance of the evidence supports that Plassmann teaches taking a stereo-pair at the selected point position. Pet. 57–58; Ex. 1007, 12:9–26; Ex. 1003 ¶¶ 189–190. Patent Owner does not persuasively dispute this point.

In summary, Petitioner adequately establishes that the cited art teaches each recitation of each claim subject to this ground, and Petitioner adequately establishes reason to combine the references teachings to reach each claim subject to this ground. Thus, after fully considering the entire record including the weight of the evidence as to the cited references teaching each recitation of claims 1–4 and 8, the weight of the evidence supporting reason to combine the cited references with reasonable expectation of success, and the weight of evidence supporting objective indicia of non-obviousness, we conclude that Petitioner persuasively establishes by a preponderance of the evidence that the subject matter of claims 1–4 and 8 would have been obvious in view of Plassmann, Treuillet, and Staller.

F. Ground Two: Obviousness Based on Plassmann, Treuillet, Staller, and Peng

Petitioner asserts that the ’119 patent’s claims 9–11 would have been obvious over Plassmann, Treuillet, Staller, and Peng. We provide an overview of Peng before we address this ground.

1. Peng (Ex. 1009)

Peng is a paper that relates to an “automatic 3D reconstruction method” to reconstruct a 3D scene using “complementary stereo information from four cameras.” Ex. 1009, 1. In particular, Peng’s “3D model

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reconstruction system us[es] images acquired from multiple stereo pairs.” *Id.* at 2. Peng explains that a “normal camera” has a “limited field-of-view.” *Id.* at 6. Accordingly, Peng describes a process to “reconstruct a large and integrated scene” by “finding more than three spatial matched points between different 3D models [and] can achieve 3D model stitching.” *Id.*; *see id.* at 2–3.

2. Discussion

Because Petitioner’s ground requires combining the teachings of Plassmann, Treuillet, Staller, and Peng (Pet. 5), we first address motivation to combine. *See KSR Int’l Co.*, 550 U.S. 398 at 418. We then address the recitations of each claim that this ground addresses.

a) Reason to combine

Petitioner argues that a person of ordinary skill in the art would have had reason to combine the disclosures of Plassmann, Treuillet, and Staller for the reasons we address above. Pet. 66. Petitioner argues that a person of ordinary skill in the art would have had reason to combine Peng’s teachings with the combined disclosures of Plassmann, Treuillet, and Staller because Peng relates to reconstruction of comprehensive 3-Dimensional representations. *Id.* Petitioner emphasizes that the ’119 patent admits that techniques of matching and stitching images were already known to persons of ordinary skill in the art. *Id.* (citing Ex. 1001, 2:6–39; Ex. 1003 ¶ 216). Petitioner argues that a person of ordinary skill in the art would recognize that Peng’s disclosures regarding reconstruction of 3-D images would be useful in the context of Plassmann, Treuillet, and Staller because they relate to providing stereophotogrammetry images of the face and torso of a subject as Peng discloses. *Id.* Petitioner argues that a person of ordinary skill in the art would expect success because such 3-D image reconstruction was known

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in the art and because the '119 patent does not specify how such reconstruction should be performed. *Id.* at 67. A preponderance of the evidence supports Petitioner's position regarding reason to combine with reasonable expectation of success. Ex. 1001, 2:6–39, 7:20–27, 10:31–37; Ex. 1003 ¶¶ 216–219. Patent Owner does not persuasively dispute this position. PO Resp. 66–67.

a) Claim 9

Claim 9 first recites “[t]he method according to claim 8 comprising taking several stereo-pairs at the selected pre-defined point position and.” Ex. 1001, 12:47–49. Petitioner argues that the '119 patent and prior art acknowledge that a person of ordinary skill in the art would have understood that more than one stereo-pairs is necessary to create a 3-D construction of certain curved surfaces. Pet. 59–60. Petitioner further argues that Hoefflin teaches stitching five views together. *Id.* Thus, Petitioner argues that the combination of references discloses this element. The preponderance of the evidence supports Petitioner's position. Ex. 1001, 1:65–2:5, 2:6–15; Ex. 1003 ¶¶ 193–196; Ex. 1015, 2. Patent Owner does not persuasively dispute this point.

Claim 9 next recites “reconstructing 3-Dimensional surfaces of the target subject (S) corresponding to each of the stereo-pairs (400); and.” Ex. 1001, 12:50–52. Petitioner argues that reconstructing 3-Dimensional purposes is the primary purpose of stereophotogrammetry for image pairs and a person of ordinary skill in the art would have been well acquainted with techniques for such reconstruction. Pet. 60–64. The preponderance of the evidence including, for example, disclosures of Treuillet and Peng, supports Petitioner's position. Ex. 1003 ¶¶ 197–211; Ex. 1009, 6; Ex. 1016, 755, 756. Patent Owner does not persuasively dispute this point.

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Claim 9 next recites “matching the different 3-Dimensional surfaces in space (500); and.” Ex. 1001, 12:53–54. As Petitioner argues, the preponderance of the evidence supports that Peng supports such matching to achieve reconstruction as referenced in Plassmann and Treuillet. Pet. 64; Ex. 1003 ¶¶ 210–212; Ex. 1009, 1–2, 6. Patent Owner does not persuasively dispute this point.

Claim 9 next recites “stitching together the different surface pieces of the target subject (S) into a comprehensive 3-Dimensional representation (600).” Ex. 1001, 12:55–57. As Petitioner argues, the preponderance of the evidence supports that Peng teaches such stitching. Pet. 65–66; Ex. 1003 ¶¶ 213–215; Ex. 1009, Figs. 9(b), 2, 7, 8. Patent Owner does not persuasively dispute this point.

b) Claim 10

Claim 10 recites “[t]he method according to claim 9 comprising using a computer program product stored on a non-transitory media to operate the steps of reconstructing, matching, and stitching.” Ex. 1001, 12:58–61. As Petitioner argues, Plassmann and Treuillet suggest using a computer executing software to accomplish the recited steps. Pet. 67–68; Ex. 1003 ¶¶ 220–222; Ex. 1007, 12:25–29; Ex. 1009, 2–6; Ex. 1016, 754–758. Patent Owner does not persuasively dispute this point.

c) Claim 11

Claim 11 first recites “[t]he method according to claim 8 comprising selecting (100): Either the closer point position (A4) and then placing a face of the target subject (S) at the closer point position.” Ex. 1001, 12:62–65. As Petitioner persuasively argues, the preponderance of the evidence supports that the cited references teach this recitation. Pet. 68; Ex. 1003 ¶ 223. Patent Owner does not persuasively dispute this point.

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Claim 11 next recites “and then taking several stereo-pairs of the face of the target subject (S) at the closer point position, processing these stereo-pairs to reconstruct 3-Dimensional surfaces of the face of the target subject (S), then matching these different 3-Dimensional surfaces in space and finally stitching together these different 3-Dimensional surfaces into a comprehensive 3-Dimensional surface representation (710) of the face of the target subject (S); or.” Ex. 1001, 12:66–13:7. As Petitioner argues, the cited references teach this recitation. Pet. 69; Ex. 1003 ¶ 224.

Claim 11 next recites

the farther point position (A3) and then placing a torso of the target subject (S) at the farther point position, and then taking several stereo-pairs of the torso of the target subject (S) at the farther point position, processing these stereo-pairs to reconstruct 3-Dimensional surfaces of the torso of the target subject (S), then matching these different 3-Dimensional surfaces in space and finally stitching together these different 3-Dimensional surfaces into a comprehensive 3-Dimensional surface representation (720) of the torso of the target subject (S).

Ex. 1001, 13:8–18.

As Petitioner persuasively argues, the cited references disclose the step of taking several stereo-pairs of the torso, when the closer position is selected, and matching and stitching resulting 3-dimensional surfaces in space to produce a comprehensive 3-D surface representation thereof. Pet. 69–70; Ex. 1003 ¶ 226.

Patent Owner argues that the Petition does not substantively discuss why claim 11 is obvious and, instead, incorrectly refers back to its explanation of claims 3 and 4. PO Resp. 68–69. In particular, Patent Owner argues that, as to claims 3 and 4, Petitioner fails to establish that it would have been obvious to create a device capable of imaging both the face and

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torso. *Id.* We disagree. Petitioner meets its burden as to claim 11 for substantially the same reasons we explain above as to claims 3 and 4.

In summary, Petitioner adequately establishes that the cited art teaches each recitation of each claim subject to this ground, and Petitioner adequately establishes reason to combine the references teachings to reach each claim subject to this ground. Thus, after fully considering the entire record including the weight of the evidence as to the cited references teaching each recitation of claims 9–11, the weight of the evidence supporting reason to combine the cited references with reasonable expectation of success, and the weight of evidence supporting objective indicia of non-obviousness, we conclude that Petitioner persuasively establishes by a preponderance of the evidence that the subject matter of claims 9–11 would have been obvious in view of Plassmann, Treuillet, Staller, and Peng.

G. Legal Sufficiency of the Petition

Patent Owner argues that the Petition is legally deficient because first, in related District Court litigation, Petitioner alleged that various claim recitations of claims 9 and 11 should be construed under Section 112(f) and, second, Petitioner violated 37 C.F.R. § 42.104(b) by not identifying how these recitations should be construed and by not identifying corresponding portions of the specification. PO Resp. 67–69.

Patent Owner’s arguments are unpersuasive. In this *inter partes* review, Petitioner argues that express construction is not necessary for any claim term. Pet. 17. This is sufficient under our Rules. *See* CTPG 44 (“[A] petitioner may include a statement that the claim terms require no express construction.”). Patent Owner does not identify any requirement that Petitioner must take a claim construction position in this proceeding that is

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identical to a position taken in a still pending district court litigation. An inconsistency, however, can weigh against an argument on how to construe a claim term. Here, however, Patent Owner does not argue that Section 112(f) actually should apply to any claim term.

In addition, we do not find persuasive Patent Owner's reliance on *Orthopediatrics Corp. v. K2M, Inc.*, IPR2018-01548, Paper 9, at 9–12 (PTAB Mar. 1, 2019). PO Resp. 67–68. This Board decision is non-precedential and we find that under the facts here. For example, in *Orthopediatrics Corp.*, the construction of the term was in dispute, which is not the situation here as neither party argues Section 112(f) applies. Paper 9, at 9. And the petitioner in *Orthopediatrics Corp.* argued, *inter alia*, that its “petition is based on the claim constructions urged by Patent Owner in the related district court litigation,” but failed to “set forth Patent Owner’s position in the related [d]istrict [c]ourt litigation.” *Id.* at 9–10.

In sum, we do not find that the Petition in this proceeding is insufficient under 37 C.F.R. § 42.104(b).

VI. CONCLUSION²¹

For the above reasons, we determine that Petitioner establishes, by a preponderance of the evidence, that

²¹ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. §§ 42.8(a)(3), (b)(2).

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(a) claims 1–4 and 8 of U.S. Patent No. 10,070,119 B2 are unpatentable under 35 U.S.C. § 103 as obvious over the combination of Plassmann, Treuillet, and Staller; and

(b) claims 9–11 of U.S. Patent No. 10,070,119 B2 are unpatentable under 35 U.S.C. § 103 as obvious over the combination of Plassmann, Treuillet, Staller, and Peng.

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–4, 8	103	Plassmann, Treuillet, Staller	1–4, 8	
9–11	103	Plassmann, Treuillet, Staller, Peng	9–11	
Overall Outcome			1–4, 8–11	

VII. ORDER

In consideration of the foregoing, it is hereby

ORDERED that Petitioner establishes by a preponderance of the evidence that claims 1–4 and 8–11 of U.S. Patent No. 10,070,119 B2 are unpatentable;

FURTHER ORDERED that Patent Owner’s Motion to Exclude is *denied* with respect to evidence addressed by § III.A, *supra*, and is *dismissed as moot* with respect to evidence addressed by § III.B, *supra*;

FURTHER ORDERED that Patent Owner’s Objections to Petitioner’s Demonstratives are *overruled*; and

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FURTHER ORDERED that, because this is a Final Written Decision, the parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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Paper 61
Date: March 9, 2023

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CANFIELD SCIENTIFIC, INC.,
Petitioner,

v.

QUANTIFICARE S.A.,
Patent Owner.

IPR2021-01518
Patent 10,165,253 B2

Before BRIAN J. MCNAMARA, JOHN D. HAMANN, and
BRIAN D. RANGE, *Administrative Patent Judges*.

HAMANN, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
Denying In Part and Dismissing In Part Patent Owner's Motion to Exclude
35 U.S.C. § 318(a)

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I. INTRODUCTION

In this *inter partes* review, instituted pursuant to 35 U.S.C. § 314, Canfield Scientific, Inc. (“Petitioner”) challenges the patentability of claims 1–4, 8–12, 15, 16, and 20–23 (“the challenged claims”) of U.S. Patent No. 10,165,253 B2 (Ex. 1020, “the ’253 patent”), owned by QuantifiCare S.A. (“Patent Owner”). We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a) (2018) and 37 C.F.R. § 42.73 (2022). For the reasons discussed herein, we determine that Petitioner shows by a preponderance of the evidence that the challenged are unpatentable.

A. *Procedural History*

Petitioner filed a Petition requesting *inter partes* review of the challenged claims of the ’253 patent. Paper 1 (“Pet.”). Patent Owner filed a Preliminary Response. Paper 7. With our authorization, Petitioner filed a Preliminary Reply (Paper 14) to the Preliminary Response relating to claim construction, and Patent Owner filed a Preliminary Sur-reply (Paper 15) in response to the Preliminary Reply.

We instituted *inter partes* review of all of the challenged claims of the ’253 patent on all of the grounds raised in the Petition. Paper 16 (“Dec. on Inst.”), 31. Patent Owner filed a Response to the Petition. Paper 21 (“PO Resp.”). Petitioner filed a Reply to Patent Owner’s Response. Paper 30 (“Pet. Reply”). Patent Owner filed a Sur-reply to Petitioner’s Reply. Paper 42 (“PO Sur-reply”).

Patent Owner filed a Motion to Exclude certain of Petitioner’s evidence (Paper 46, “Mot. Excl.”) and Petitioner filed an Opposition. Paper 47 (“Opp. Mot. Excl.”). Patent Owner filed a Reply in support of its Motion. Paper 53 (“Reply Mot. Excl.”).

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Patent Owner filed objections to Petitioner’s demonstratives. Paper 58 (“PO Objs.”). Patent Owner alleges, *inter alia*, that certain of Petitioner’s slides contain new argument. *See generally id.*

An oral hearing was held on December 14, 2022. A transcript of the oral hearing is included in the record. Paper 60 (“Tr.”).

B. Real Parties-in-Interest

The parties identify themselves as the real parties-in-interest. Pet. 2; Paper 4, 1.

C. Related Matters

The parties identify the following as a related matter: *QuantifiCare, Inc. v. Canfield Scientific, Inc.*, C.A. No. 1:20-cv-12305 (D.N.J.). Pet. 3; Paper 4, 1. In addition, Petitioner has filed petitions for *inter partes* review of two additional patents related to the ’253 patent, that also are owned by Patent Owner: (i) U.S. Patent No. 10,070,119 B2 (“the ’119 patent”) (IPR2021-01511) and (ii) U.S. Patent No. 10,681,334 B2 (IPR2021-01519).

D. The Challenged Patent

The ’253 patent is titled “Device and Method to Reconstruct Face and Body in 3D.” Ex. 1020, code 54. The ’253 patent relates to a stereophotogrammetry device used “to picture and reconstruct in 3D the surface of objects of different sizes,” e.g., different body parts such as the face and the torso. *Id.* at 3:27–30; *see id.* at 1:13–21, 1:48–55. By way of background, the ’253 patent explains that “[s]tereophotogrammetry consists in [simultaneously] gathering the images of a subject from at least two view with a calibrated camera,” i.e., a “stereo-pair.” *Id.* at 1:31–36. The stereo-pair is used to “reconstruct . . . a dense representation in 3-Dimensions of the surface of the observed object.” *Id.* at 1:37–39.

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Figures 1 and 2, reproduced below, respectively show side- and top-views of an “implementation” of a stereophotogrammetry device and its components. *Id.* at 3:53–56.

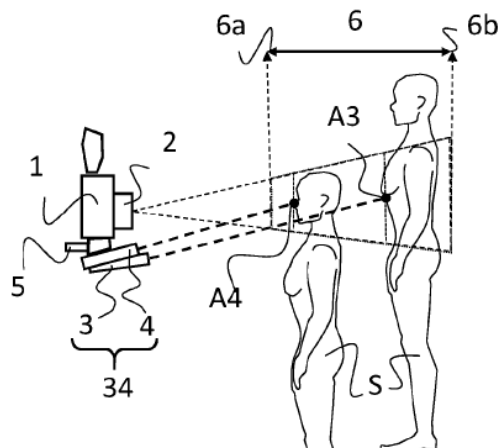


FIG. 1

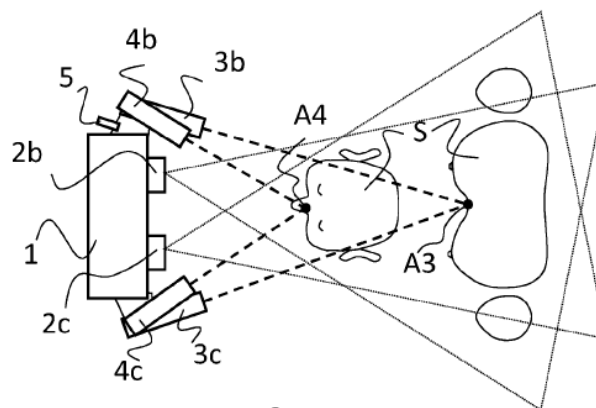


FIG. 2

Figures 1 represents a possible implementation of the '253 patent's device as viewed from the side, and Figure 2 represents a possible implementation of the device as viewed from the top. *Id.* As shown in Figures 1 and 2, camera body (1) includes double optics (2). *Id.* at 8:34–35. As shown in Figure 2, double optics (2) are “composed of two sub-optics (2b) and (2c), enabling the acquisition of a stereo[-]pair [of images] corresponding to two slightly different viewing angles” simultaneously. *Id.* at 8:35–38; *see id.* at 3:39–42. In addition, Figure 8 shows a series of stereo-pair images taken at different angles for a face. *Id.* at 11:12–19.

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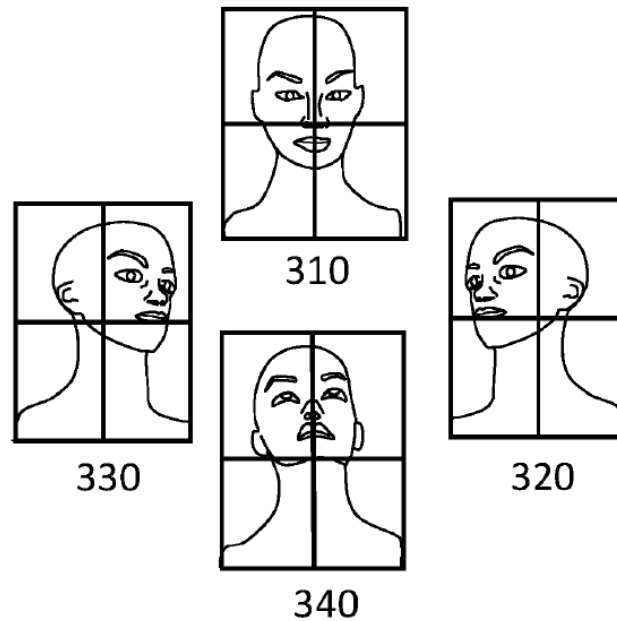


FIG. 8

The '253 patent specification describes Figure 8 as presenting “viewpoints optimized for imaging a face using a field of view close to an A4 surface format.” *Id.* at 4:4–5. Using the captured stereo-pairs, “a comprehensive representation in 3D of the surface of the subject (S)” can be constructed. *Id.* at 10:37–48.

Further, the stereophotogrammetry device captures stereo-pairs of images at “two distinct distances for picture taking corresponding respectively to position (A3) and (A4)” such that the stereo-pairs of images are in focus at positions A3 and A4, which are within the device’s depth of field 6. *Id.* at 8:40–50; *see id.* at 6:23–26. For example, position A3 is used for capturing images of the torso while position A4 is used for capturing images of the face. *Id.* at 6:14–16; *see id.* at 1:51–59. Positions A3 and A4 can be identified by the convergence of respective light patterns projected onto the subject to be imaged, the respective light patterns converging at the distances for positions A3 and A4. *Id.* at 4:51–5:5. For example, as shown

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in Figure 2, a light pattern emitted by first pair of light beamers (3b) and (3c) converge at point (A3) and a different light pattern emitted by second pair of light beamers (4b) and (4c) converge at point (A4). *Id.* at 8:51–55; *see id.* at 4:61–64. Accordingly, “by placing the subject so that the light patterns projected by a first pair of beamers are superposed on the surface of the subject[,], one is placing the subject at” the first predefined position (and similarly for the light pattern emitted by the second pair of beamers converging at the second position). *Id.* at 4:57–61; *see id.* at 5:14–35.

E. Challenged Claims

Petitioner challenges claims 1–4, 8–12, 15, 16, and 20–23 of the ’253 patent. Pet. 5. Claim 1 is the only challenged independent claim. Claim 1 is illustrative of the challenged claims, and reads as follows:

1. A device for stereophotogrammetry comprising a camera body (1) and a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views according to two different angles, wherein the device is comprising a positioning system (34) configured to signal when a target subject (S) is reaching a pre-defined distance position to the camera (1) corresponding to one of at least two distinct pre-defined distance positions (A3, A4) of the target subject (S) relative to the camera body (1) of the stereophotogrammetry device, the at least two distinct predefined distance positions comprising a closer distance position (A4) and a farther distance position (A3), the closer distance position (A4) being closer to the camera body (1) of the stereophotogrammetry device than the farther distance position (A3) to the camera body (1) of the stereophotogrammetry device.

Ex. 1020, 11:42–57.

F. Instituted Grounds of Unpatentability

We instituted trial based on the following grounds of unpatentability, which are all the grounds of unpatentability raised in the Petition:

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Claim(s) Challenged	35 U.S.C. § ¹	Reference(s)/Basis
1–4, 8–11, 15, 16, 20	103	Plassmann, ² Treuillet, ³ Staller ⁴
12	103	Plassmann, Treuillet, Staller, Kingslake ⁵
21–23	103	Plassmann, Treuillet, Staller, Peng ⁶

Pet. 5, 28–81. Petitioner submits in support of its arguments the Declaration of Gerhardt Paul Otto, Ph.D. (Ex. 1003) and the Supplemental Declaration of Gerhardt Paul Otto, Ph.D. (Ex. 1053). Patent Owner submits in support of its arguments the Declaration of Dr. Daniel van der Weide (Ex. 2006), the Second Declaration of Dr. Daniel van der Weide (Ex. 2013), and the Declaration of Dr. Jean-Philippe Thirion (Ex. 2019).

II. LEVEL OF ORDINARY SKILL IN THE ART

To determine whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). In assessing the level of ordinary skill in the art, various factors

¹ The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. § 103 that became effective on March 16, 2013. Because the ’253 patent issued from an application having an effective filing date after March 16, 2013, we apply the AIA version of the statutory basis for unpatentability.

² WO 2010/097572 A2, published Sept. 2, 2010 (Ex. 1007).

³ Sylvie Treuillet, et al., *Three-Dimensional Assessment of Skin Wounds Using a Standard Digital Camera*, IEEE Transactions on Medical Imaging, Vol. 28, No. 5 at 752 (2009) (Ex. 1016).

⁴ US 7,257,322 B2, issued Aug. 14, 2007 (Ex. 1006).

⁵ Rudolf Kingslake, *A History of the Photographic Lens*, Academic Press Inc. (1989), (selected portions filed as Ex. 1028).

⁶ Qi Peng et al., *Automated 3D Scenes Reconstruction Using Multiple Stereo Pairs from Portable Four-Camera Photographic Measurement System*, International Journal of Optics, Vol. 2015 (2015) (Ex. 1009).

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may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citing *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962–63 (Fed. Cir. 1986)). “[O]ne or more factors may predominate.” *Id.*

Petitioner argues that one of ordinary skill in the art “would have had a working understanding of photography, stereophotogrammetry, and distance measuring in photography or stereophotogrammetry, a master’s degree with a scientific focus on subjects such as optics and/or image processing, with at least about three years of experience in the field of photography, and stereophotogrammetry, as well as image processing in these fields, or an equivalent qualification.” Pet. 15 (citing Ex. 1003 ¶¶ 17–20).

Patent Owner argues that one of ordinary skill in the art “would have a Bachelor’s degree in Physics or Electrical Engineering or a similar field and two to three years of experience, including in image processing and computer graphics.” PO Resp. 23 (citing Ex. 2013 ¶¶ 30–32). Patent Owner adds that “Petitioner’s assertion of a higher level . . . is incorrect.” *Id.*

The parties do not substantively address the differences in their proposed definitions for one of ordinary skill in the art. Pet. Reply. 8; PO Resp. 23; *see generally* PO Sur-reply. Moreover, the parties agree that which definition we adopt does not substantively impact our analysis of the parties’ arguments concerning unpatentability. Tr. 29:19–30:9, 75:20–25.

Because Patent Owner’s definition of the level of skill in the art is consistent with the ’253 patent and the asserted prior art, we adopt it for purposes of this Final Written Decision. *See Okajima v. Bourdeau*, 261 F.3d

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1350, 1355 (Fed. Cir. 2001); *GPAC*, 57 F.3d at 1579; *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978). In addition, we do not find sufficient support in the record for requiring one of ordinary skill in the art to have had a master's degree. Compare Ex. 1003 ¶ 20 (requiring a master's degree), with Ex. 2013 ¶ 31 (testifying why a master's degree was unnecessary). Our analysis herein, however, does not turn on which of the parties' definitions we adopt.

III. CLAIM CONSTRUCTION

Because the Petition was filed after November 13, 2018, we apply the same claim construction standard that would be used in a civil action under 35 U.S.C. § 282(b), following the standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b); 83 Fed. Reg. 51,340, 51,340–41, 51,343 (Oct. 11, 2018). In applying such standard, claim terms are generally given their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art, at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

Petitioner states that it “does not believe express constructions are required for any terms.” Pet. 16 (citing Ex. 1003 ¶ 62); Tr. 28:13–16 (Petitioner agreeing that the claim terms have their plain and ordinary meaning); Pet. Reply 1. Patent Owner likewise argues that the claim terms should have their plain and ordinary meaning. PO Sur-reply 1.

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However, the parties dispute the scope of the plain and ordinary meaning of “two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views according to two different angles,” as recited in claim 1. PO Resp. 1–23; Pet. Reply 1–8; PO Sur-reply 1–9. Thus, we address the parties’ arguments to resolve this dispute. *See Eon Corp. IP Holdings v. Silver Spring Networks*, 815 F.3d 1314, 1318 (Fed. Cir. 2016) (finding that disputes between the parties over the plain and ordinary meaning of a term should be resolved as a matter of claim construction).

The gravamen of the parties’ dispute is what “different angles” refers to in the context of this limitation. According to Patent Owner, “different angles” refers to the orientation of the optical axis of each sub-optic. *E.g.*, PO Resp. 5–7. Specifically, Patent Owner argues that the limitation excludes configurations where the sub-optics’ optical axes are in parallel because the two views would be acquired at the same angle. *E.g.*, *id.* In contrast, Petitioner argues that “different angles” refers to the sub-optics viewing a *subject* from different angles, such as when the sub-optics are spaced apart—parallel configurations are not excluded. *E.g.*, Pet. Reply 1.

We address in detail the parties’ arguments below, starting with the intrinsic evidence.

A. *Claim Language*

Patent Owner argues that the language of the claims “does not mention light ‘from the subject’ or ‘object to be imaged,’ much less angles at which light is received from different points on a subject/object.” PO Resp. 19 (citing Ex. 2013 ¶ 101). “Rather, the ‘two different angles’ limitation defines an intrinsic characteristic of the sub-optics, *i.e.*, how they are ‘configured’” or angled, according to Patent Owner. *Id.* (citing Ex. 2013 ¶ 100).

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We disagree with Patent Owner. Rather, we conclude that the claim language does not mean that the sub-optics’ optical axes are angled, but instead means that the sub-optics each view a subject from a different angle, as Petitioner argues. Ex. 1020, 11:43–45; Pet. Reply 7. Specifically, this limitation recites that the two sub-optics are “configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1020, 11:43–45. Notably, “according to two different angles” directly follows “two views,” rather than directly following “configured.” *Id.* And “view” means “[a] scene or an arrangement of subject material for a photograph,” according to a technical dictionary provided by Patent Owner. Ex. 2014,⁷ 210 (defining “view”). In other words, the term “view” itself refers to viewed subject material—a target subject.

In addition, we find unavailing Patent Owner’s argument that “the ‘subject’ is claimed only in connection with the ‘positioning system (34)’ ‘configured to signal when a target subject (S) is reaching[. . . pre-defined distance positions (A3, A4) of the target subject (S) relative to the camera body (1).’ PO Resp. 19 (citing Ex. 1020, 11:46–51; Ex. 2013 ¶ 102). Again, the term “view” implicates the subject. Ex. 2014, 210.

We also find unavailing Patent Owner’s argument that the claims “disclose configuring the sub-optics according to ‘two different angles’ as a prerequisite to ‘pre-defining’ the ‘positions (A3, A4) of the target subject (S),’ as further claimed, and locating the subject at such positions within the two views.” PO Resp. 19–20 (citing Ex. 2013 ¶ 103); *see also id.* at 20 (arguing that dependent claims also support this argument). This argument

⁷ Leslie Stroebel & Hollis N. Todd, *Dictionary of Contemporary Photography* (1974).

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is inapposite, and does not exclude parallel sub-optics. Rather, as Patent Owner acknowledges, conventional stereophotogrammetry devices can include parallel sub-optics “configured (spaced) to acquire two views,” and provide a stereoscopic binocular area where “the parallel views intersect to form stereo-pairs that can be reconstructed into three-dimensional representations.” PO Resp. 5–6; Ex. 2013 ¶ 67; Ex. 2015,⁸ 90. Hence, positions (A3, A4) can be predefined distances for the target subject S within that stereoscopic binocular area.

We likewise find unavailing Patent Owner’s argument that “the ‘two different angles’ limitation has nothing to do with the angles at which the sub-optics receive light from a subject, but rather defines the space within which the subject must be located to be imaged in the first place.” PO Resp. 20 (citing Ex. 2013 ¶ 100); PO Sur-reply 2. This argument also is inapposite, and does not indicate that the claimed sub-optics’ axes are not in parallel, as Patent Owner argues. Rather, the space within which the subject must be located can be the stereoscopic binocular area. Ex. 2015, 90; PO Resp. 4.

We also find unavailing Patent Owner’s argument that because “[d]isplaced sub-optics may be configured to acquire two views at the same angle, or at ‘two different angles,’” “construing ‘two different angles’ to mean any displaced sub-optics would read the ‘two different angles’ limitation out of the claims.” PO Resp. 22 (citing Ex. 2013 ¶ 107); PO Sur-reply 5 (making same argument). Rather, we conclude that “according to two different angles,” in the context of the limitation, is needed to claim a stereophotogrammetry device. Put differently, we agree with Petitioner and

⁸ Richard W. Kroon, *3D A-to-Z, An Encyclopedic Dictionary* (2012).

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conclude that claim 1 does not otherwise recite that the two sub-optics are spaced, such as in a conventional stereophotogrammetry device. Ex. 1020, 11:42–57; Pet. Reply 7 (citing Ex. 1053 ¶ 31).

Although the preamble for claim 1 recites “[a] device for stereophotogrammetry,” “[g]enerally, the preamble does not limit the claims.” Ex. 1020, 11:42; *Georgetown Rail Equip. Co. v. Holland L.P.*, 867 F.3d 1229, 1236 (Fed. Cir. 2017) (citation omitted). We also are persuaded by Petitioner’s argument that “the preamble here is not limiting, because the body of the claim provides a complete description of the device.” Pet. Reply 7 (citing *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997)). Hence, “two different angles” is not read out of the claims, but rather serves to claim a stereophotogrammetry device (e.g., by requiring spacing of the sub-optics).

Regardless, as Petitioner notes, no “canon of claim construction is absolute in its application and [] some surplusage may exist in some claims.” Pet. Reply 7 (quoting *Decisioning.com, Inc. v. Federated Dep’t Stores, Inc.*, 527 F.3d 1300, 1312 (Fed. Cir. 2008)). And we view the phrase “configured for a simultaneous acquisition of two views according to two different angles” as referring to a stereophotogrammetry device, regardless of whether every word is needed to convey it.

In addition, we find unavailing Patent Owner’s argument that Petitioner makes new arguments concerning viewing the subject from different angles and the preamble not being limiting. PO Sur-reply 1 & n.1. Simply put, these arguments from Petitioner involve issues related to claim construction regarding the scope of the plain and ordinary meaning of this limitation, which was raised by Patent Owner in its Response. Petitioner is allowed to respond. *See Consolidated Trial Practice Guide* (November

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2019)⁹ (“CTPG”), 45 (“The petitioner may respond to any such new claim construction issues raised by the patent owner.”).

B. The '253 Patent Specification

The parties each argue that the '253 patent Specification supports their arguments for the plain and ordinary meaning of this limitation. More specifically, Patent Owner argues that Figures 2–5 support that the sub-optics are oriented to have non-parallel (i.e., inwardly angled) optical axes. *E.g.*, PO Resp. 6. Patent Owner illustrates this position by annotating Figure 2 of the '253 patent. PO Resp. 18. We reproduce Patent Owner's annotated figure below.

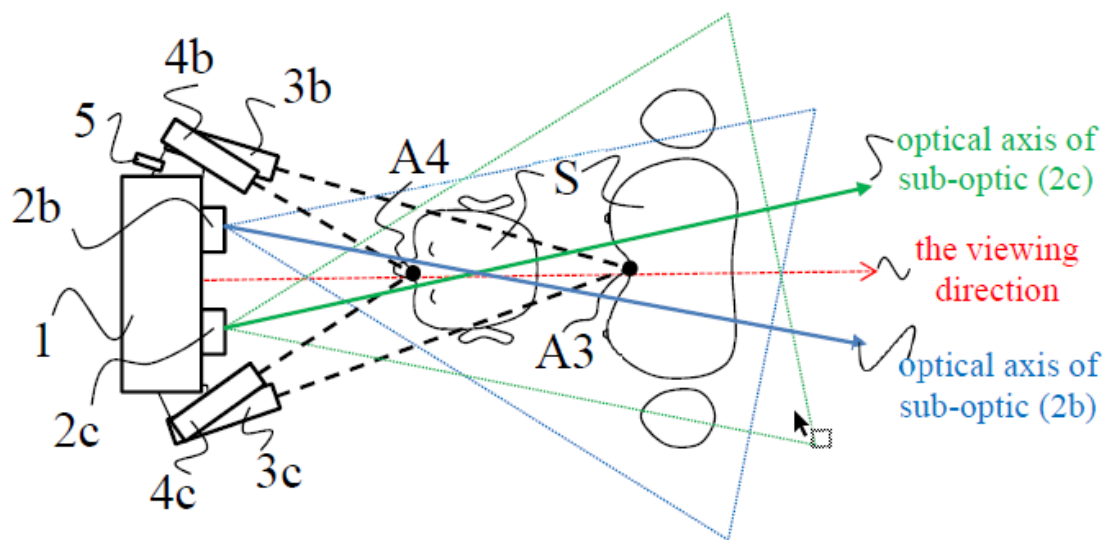


Figure 2 “represent[s] a possible implementation of the device viewed from the top.” Ex. 1020, 3:55–56. Patent Owner annotates Figure 2 by coloring the pyramid extending from sub-optic 2b blue and coloring the pyramid extending from sub-optic 2c green. PO Resp. 18. Patent Owner also adds a solid blue arrow and a solid green arrow from each sub-optic to the point where it perpendicularly bisects the respective base of each respective

⁹ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

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pyramid. *Id.* Patent Owner labels each of these arrows as the “optical axis” of the respective sub-optic. *Id.* Patent Owner also adds a dotted arrow from the midpoint between the sub-optics through the centerpoint of an illustrated face and torso, and labels the arrow “the viewing direction.” *Id.*

We agree with Patent Owner that Figures 2–5 illustrate pyramid-shaped views acquired by the sub-optics where the pyramids are inwardly angled (rather than being perpendicular to the device’s plane). Ex. 1020, Figs. 2–5. The Specification indicates that all of these figures illustrate *possible* or *exemplary* implementations. *See, e.g., id.* at 3:55–59 (stating that Figures 2 and 3 each illustrate a “possible implementation”); 9:37–38 (stating that Figure 4 is an “exemplary device”); 9:45–46 (stating that Figure 5 is an “exemplary device”). Thus, the Specification does not indicate that having non-parallel optical axes for the pyramids is essential to the invention; the Specification never even uses the term “optical axis.” To the contrary, the Specification broadly provides that “[t]he double optics of the stereophotogrammetry device can be manufactured in different ways without impacting the functionality of the invention, provided that it is characterized by an increased depth of field.” *Id.* at 4:25–28.

Moreover, the Specification repeatedly refers to the different angles of the sub-optics relative to the viewed subject. *See, e.g.,* Ex. 1020, 4:14–17 (referring to “double optics enabling the acquisition of two simultaneous views with different angles *of the subject*”) (emphasis added), 4:30–33 (referring to “double optics” using “secondary mirrors each receiving one image *of the subject* with a slightly different angle”) (emphasis added); Pet. Reply 7 (citing Ex. 1053 ¶¶ 33–34).

In addition, we find unavailing Patent Owner’s arguments directed to problems identified in the Background of the Specification and the

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advantages of the '253 patent. PO Resp. 10–15. For example, Patent Owner argues that the '253 patent discloses that portable stereophotogrammetry devices previously developed included “a single, nominal distance for picture taking which is optimized either for the face or for breast, but not optimized for both applications at the same time.” PO Resp. 9 (quoting Ex. 1020, 3:16–20; citing Ex. 2013 ¶ 73). Patent Owner adds that the '253 patent “ties the ‘two different angles’ limitation to overcoming the problem in the prior art and achieving the advantage of the invention” (i.e., a single stereophotogrammetry device for both distances). *Id.* at 10 (citing Ex. 1020, 3:33–36); *see also id.* (citing Ex. 1020, 4:30–33, 8:35–38; Ex. 2013 ¶ 76) (making same argument).

According to Patent Owner, however, if the sub-optics are configured for parallel views the field of view at point (A4) in Figure 2 “is too small to image the face and would not achieve the ‘advantage of the invention,’ *i.e.*, ‘a single portable stereophotogrammetry system . . . enabling the 3D reconstruction of the head . . . and . . . torso.’” PO Resp. 15 (quoting Ex. 1020, 8:19–26; citing Ex. 2013 ¶¶ 56, 87). These arguments are unavailing. Rather, we agree with Petitioner and find that “[s]imply moving the subject further from the camera would place the face” within the intersection of the parallel view pyramids. *See* Pet. Reply 4–6; Ex. 1053 ¶ 29. As can be seen for the version of Figure 2 modified by Patent Owner to show parallel view pyramids, a sufficient field of view for the face and torso is within the binocular area if the subject is moved further from the camera. *See* PO Resp. 14 (modifying Ex. 1020, Fig. 2); *see also* Ex. 1053 ¶ 29 (testifying that moving further away “[i]f no other changes were made, . . . would slightly lower the 3D resolution of the surface captured by the

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device compared to using angled frustums,” “[h]owever, in this application area a slight decrease in resolution is acceptable”).

In sum, we find that the ’253 patent Specification does not limit the plain and ordinary meaning of this limitation so as to exclude sub-optics having parallel optical axes.

C. Prosecution History

We now turn to the prosecution history of the ’119 patent, which is the parent of the ’253 patent. Ex. 1020, code (63). The prosecution history “can often inform the meaning of the claim language by demonstrating how the inventor understood the invention.” *Phillips*, 415 F.3d at 1317. Such is the case here.

In particular, Patent Owner treated the “according to two different angles” language differently during prosecution than it does now. During prosecution, the Examiner rejected the challenged claims over Hoffmeier¹⁰ and concluded that Hoffmeier disclosed a stereophotogrammetry device comprising “two sub-optics (2b) and (2c) . . . configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1002 (’119 patent File History), 63–66; Ex. 1053 ¶ 12; Pet. Reply 1–3. Hoffmeier’s Figure 3 depicts its device and illustrates two views of its subject in its Figure 4. Ex. 1005 ¶¶ 25–26; Ex. 1053 ¶ 13. We reproduce these two figures side by side below.

¹⁰ US 2011/0175987 A1, published July 21, 2011 (Ex. 1005).

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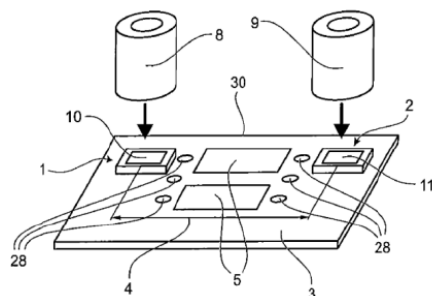


FIG. 3

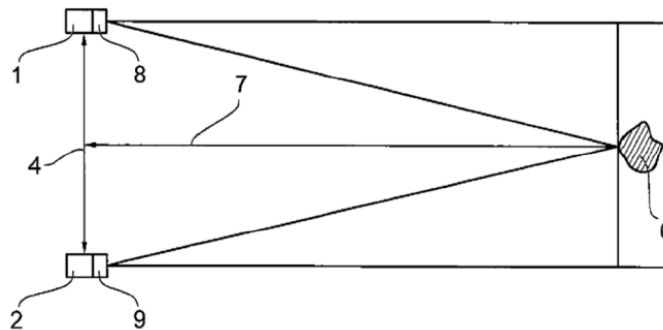


FIG. 4

Ex. 1005, Figs. 3–4. Figure 3 is a perspective view of the Hoffmeier system. *Id.* ¶ 25. Figure 4 shows a schematic structure of a stereo camera system with the Hoffmeier stereo camera system board. *Id.* ¶¶ 10, 26. The evidence supports that Hoffmeier’s lenses face forward in parallel rather than at an angle. *Id.* at Figs. 3–4, ¶ 35 (“The two optical systems 8, 9 can be coupled to the board 3 such that the respective optical axis of an optical system 8, 9 runs through the center point of the image sensing area 10, 11 of an image detection sensor 1, 2”); *see also* Ex. 1053 ¶ 14 (Petitioner’s expert opining that Hoffmeier’s Figure 4 “shows components 8 and 9 as having parallel axes”).

During prosecution, Patent Owner’s Chief Executive Officer (“CEO”), Dr. Jean-Philippe Thirion, who also is the named inventor for the ’119 and ’253 patents, submitted a response to the Examiner’s rejection. Ex. 1002, 88–107; Ex. 2019 ¶ 8. Notably, in that submission, Patent Owner admitted that Hoffmeier teaches claim 1’s “two different angles” recitation as follows:

Being devoid of any positioning system external to the stereovision system itself makes Hoffmeier quite different from the invention described in ’981 [(referencing the ’981 application that led to the ’119 patent)]. Hoffmeier therefore discloses “A device for stereophotogrammetry comprising a camera body (1) and a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views

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according to two different angles” as in claim 1 of ’981, but it is all that Hoffmeier discloses relative to claim 1 of ’981.

Ex. 1002, 92 (bold emphasis added). Patent Owner further admitted that “8 and 9 in FIG 3 of Hoffmeier exactly correspond to 2b and 2c in FIG 2 of [the ’119 patent].” *Id.* at 91–92.

Patent Owner’s admissions during prosecution suggest to the public that Patent Owner understood that spaced optics with parallel optical axes fall within the scope of the disputed limitation. Patent Owner now downplays these admissions by arguing that Hoffmeier “is ambiguous as to whether the optical axes of 8, 9 are angled inwards, or are parallel.” PO Sur-reply 8. Any ambiguity does not help Patent Owner’s current position. Rather, despite the purported ambiguity, Patent Owner admitted that Hoffmeier taught “two views according to two different angles.” Ex. 1002, 92. The prosecution history, thus, suggests that the orientation of Hoffmeier’s optical axes is not important to whether the “two different angles” recitation is met. As such, Patent Owner’s prosecution history statements align with the present arguments of Petitioner, not Patent Owner.

D. Parallel Litigation

During district court litigation involving the ’119 patent, Patent Owner responded to Petitioner’s invalidity allegations regarding the Plassmann reference by agreeing that Plassmann teaches the now disputed “according to two different angles language.” Ex. 1037 (Patent Owner Response to Invalidity Chart), 2; *see also* Pet. Reply 6. Specifically, Patent Owner stated the following: “QuantifiCare agrees that the quoted language and figure include, *inter alia*, a double-optics comprising two sub-optics configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1037, 2.

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Patent Owner now disputes that Plassmann teaches this recitation. *See, e.g.*, PO Resp. 27–30 (arguing that Petitioner’s contention that Plassmann acquires “two views according to two different angles” is incorrect). Thus, Patent Owner’s position in the district court litigation was consistent with its position during prosecution but inconsistent with its position in the current proceeding.¹¹ Thus, this inconsistency at least somewhat weighs against Patent Owner’s arguments.

In addition, we find unavailing Patent Owner’s argument that its agreement was subject to an objection that Petitioner failed to identify specifically where in Plassmann the limitation was taught. PO Sur-reply 9 (Ex. 1037, 2). Petitioner, however, clearly identified Plassmann’s Figure 1B and a passage describing it, which is the same structure Petitioner relies on here. Ex. 1037, 2.

We also find unavailing Patent Owner’s argument that this issue was raised belatedly by Petitioner. PO Sur-reply 8. As we discuss above, Petitioner may make this argument because it relates to issues of claim construction Patent Owner raises in its Response. CTPG, 45.

E. Summary

In view of the record as a whole, the weight of the evidence supports that claim 1’s “two views according to two different angles” language does not require that the optical axis of each sub-optic be angled differently, but instead requires only that the sub-optics view the subject from different

¹¹ Patent Owner argues that this extrinsic evidence should be disregarded. PO Sur-reply 8–9. We disagree. Although the extrinsic evidence is entitled to less weight, it nonetheless bolsters the intrinsic evidence establishing that Patent Owner—outside of the instant proceeding—understood “two views according to two different angles” means what Petitioner contends it means.

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angles. Put differently, we conclude that this disputed limitation covers configurations of the two sub-optics that are spaced, regardless of whether the sub-optics' optical axes are orientated in parallel.

IV. PRINCIPLES OF LAW

“In an [inter partes review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring inter partes review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

A claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time of the invention to a person having ordinary skill in the art. *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of non-obviousness, if present. *See Graham*, 383 U.S. at 17–18. When evaluating a claim for obviousness, we also must “determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

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V. OBJECTIVE INDICIA OF NONOBVIOUSNESS

Objective indicia of nonobviousness may include long-felt but unsolved need, failure of others, unexpected results, commercial success, copying, licensing, industry praise, and expert skepticism. *Mintz v. Dietz & Watson, Inc.*, 679 F.3d 1372, 1379 (Fed. Cir. 2012). Objective indicia are only relevant to the obviousness inquiry if there is a nexus between the claimed invention and the objective indicia of nonobviousness. *In re Affinity Labs of Tex., LLC*, 856 F.3d 883, 901 (Fed. Cir. 2017). A rebuttable presumption of nexus applies only “when [a patent owner] shows that the asserted objective evidence is tied to a specific product and that product ‘embodies the claimed features, and is coextensive with [the claims].’” *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (quoting *Polaris Indus. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1072 (Fed. Cir. 2018)). On the other hand, a patent owner is not entitled to a presumption of nexus if the patented invention is only a component of a commercially successful machine or process. *Id.* (reaffirming the importance of the “coextensiveness” requirement).

Applying *Fox Factory*, the Board uses a two-step analysis in evaluating nexus between the claimed invention and objective evidence of nonobviousness, also referred to as secondary considerations. *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 33 at 33 (PTAB Jan. 24, 2020) (precedential). We first consider whether Patent Owner has demonstrated “that its products are coextensive (or nearly coextensive) with the challenged claims,” resulting in a rebuttable presumption of nexus. *Id.* at 33. If not, that “does not end the inquiry into secondary considerations”; “the patent owner is still afforded an opportunity to prove nexus by showing that the evidence of secondary considerations is the ‘direct result of the unique

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characteristics of the claimed invention.” *Id.* (quoting *Fox Factory*, 944 F.3d at 1373–75). For the reasons discussed below, we find that Patent Owner does not demonstrate (i) that its product is coextensive with the challenged claims for a presumption to attach, and (ii) the requisite nexus with evidence that the secondary considerations are the direct result of the unique characteristics of the claimed invention.

A. *Presumption of Nexus*

Patent Owner argues that “its LifeViz Infinity (‘Infinity’) product is disclosed and claimed in the patent.” PO Resp. 55 (citing Ex. 2013 ¶ 213). Patent Owner argues that Petitioner “does not dispute this assertion.” *Id.* (citing Pet. 81). “Therefore, nexus of secondary considerations regarding the Infinity to the invention is presumed,” according to Patent Owner. *Id.* (citing *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1330 (Fed. Cir. 2016)).

We disagree. Patent Owner does not provide an analysis demonstrating that its Infinity product is coextensive (or nearly coextensive) with the challenged claims. Rather, Patent Owner cites to the following testimony of Dr. van der Weide: “I have reviewed the LifeViz Infinity device and conclude that it embodies the invention of the [’]253 Patent. More specifically, the Infinity possesses all the features listed in claim 1 of the patent.” *Id.* (citing Ex. 2013 ¶ 213). Simply put, Patent Owner fails to provide any analysis whatsoever. *Id.*; *see also* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”).

Moreover, Patent Owner’s reliance on *WBIP* is misplaced. In that case, “*WBIP* presented evidence that specific products . . . [we]re embodiments of the invention as claimed in the asserted claims,” and that

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provided a basis for finding a presumption of nexus. *WBIP*, 829 F.3d at 1329–31. Such is not the case here.

In sum, Patent Owner does not provide the required analysis demonstrating that Infinity is coextensive (or nearly coextensive) with the challenged claims. PO Resp. 55; *Lectrosonics*, Paper 33 at 33. We, therefore, find that a presumption of nexus is inappropriate.

B. Direct Result of the Unique Characteristics of the Claims

For the second step of our analysis, we look to whether Patent Owner demonstrates the requisite nexus with evidence that any secondary considerations are the direct result of the unique characteristics of the claimed invention. In particular, we address below Patent Owner’s arguments directed to the secondary considerations of (i) commercial success, (ii) copying, (iii) long-felt need, and (iv) praise for the invention. PO Resp. 55–66.

1. Commercial Success

For the commercial success indicia to support nonobviousness, Patent Owner needs “to show both commercial success and that a nexus exists between that success and the merits of the claimed invention.” *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1350 (Fed. Cir. 2012). We start with the latter of these requirements and look to Patent Owner’s arguments that a nexus exists between the purported commercial success and the challenged claims.

First, Patent Owner argues that “[a] nexus between sales of Infinity and the claimed invention is presumed because Infinity ‘is the invention disclosed and claimed in the patent.’” PO Resp. 61 (citing *WBIP*, 829 F.3d at 1330). We find this argument unavailing because as we find above,

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Patent Owner does not demonstrate that a presumption should attach. *See supra* Section (V)(A).

We also find unavailing Patent Owner’s argument that “customers have identified claimed features as important to their use of the invention.” PO Resp. 61 (citing PO Resp. 59–60 (arguing that the claimed invention has received praise)). This argument does not address whether any sales, for example, of the Infinity product were owed to the merits of the claimed invention, nor that such purported praise lead to actual demand.

We also find unavailing Patent Owner’s argument that “Infinity sales were due to claimed features of the invention, *e.g.*, its ‘dual-distance’ functionality, which permitted customers to avoid buying multiple products or a non-portable multi-head system to accomplish the same tasks – as was noted by the EuroMediCom press release.” PO Resp. 62 (citing Ex. 2020,¹² 4). The announcement identifies the Infinity product as “BEST AESTHETIC DEVICE,” and describes the product, but does not evidence any specific demand for, or sales of, the Infinity product due to any features of the challenged claims. *See* Ex. 2020, 4. Nor does Patent Owner sufficiently address whether dual-distance functionality comprises the unique characteristics of the claimed invention.

We also find unavailing Patent Owner’s argument that “[t]he primary functional difference between [Petitioner’s] H2 and H1 [products] is that H2 can image the body (at a different distance) in addition to the face,” and that “[i]t follows that the large differential in production of the H2 as compared

¹² *Winners 2018-2019*, EuroMediCom (Jan. 29, 2021) <https://www.euromedicom.com/mca-2018/en/trophy/Winners-2018-2019.html>.

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to H1 is due to that additional functionality.” PO Resp. 62 (citing Ex. 2034¹³ (arguing that Vectra H1 images face only); Ex. 2030¹⁴ (arguing that Vectra H2 captures a face or body image). Patent Owner provides no evidence for why this purported differential in production occurred; rather, Patent Owner speculates.

Second, we do not find that Patent Owner demonstrates commercial success of the Infinity product. To establish commercial success, Patent Owner relies on a declaration from its CEO, Dr. Thirion. PO Resp. 61–64 (citing Ex. 2019 ¶¶ 29–37). Although Dr. Thirion provides evidence of increasing sales of Infinity, Dr. Thirion does not give any specific information about unit sales, revenue, or the Infinity’s market share relative to the greater medical imaging market. Ex. 2019 ¶¶ 29–37.

In addition, we find unavailing Patent Owner’s argument that Petitioner “does not contest that its H2 infringes, and thus its sales are relevant to the invention’s commercial success.” POSur-reply 25 (citing *Truswal Sys. Corp. v. Hydro-Air Eng’g, Inc.*, 813 F.2d 1207, 1215 (Fed. Cir. 1987) & n. 12 (citing Ex. 2013 ¶¶ 215–219). We find insufficient support for Patent Owner’s assertion that Petitioner does not contest infringement. And we find Patent Owner’s reliance on *Truswal* misplaced. First, we note that Patent Owner cites to Judge Rich’s dissent in *Truswal*. Second, Judge Rich stated the “once an infringer is sued *and proved to be an infringer*, its sales are appropriately proved and added to the others,” and that “[i]t is necessary to establish that the alleged copies are actual infringements of the patent in suit before they can possibly be relevant and counted as successes

¹³ *Vectra H1 Quick Reference Guide*, Canfield (2014).

¹⁴ *Vectra H2: Capturing a FACE or BODY image*, Canfield.

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of the patented invention.” Truswal, 813 F.2d at 1215 (Rich, J., dissenting).
Petitioner, as of now, has not been proved to infringe.

In sum, we find that Patent Owner does not show sufficient nexus between the purported commercial success and the claimed invention, and fails to show commercial success.

2. *Copying*

Patent Owner argues that Petitioner’s Vectra H2 “is a copy of *the invention*, in structure, function, operation, and use.” PO Resp. 64–66 (emphasis added). Patent Owner goes on to argue that Petitioner’s Vectra H2 mimics patented features and Infinity’s use of red and green light beamers. *Id.* at 64. Patent Owner emphasizes that Petitioner launched its H2 device “[e]ighteen months after Quantificare launched its Infinity.” *Id.* Based on these allegations, it is unclear whether Patent Owner alleges that Petitioner copied Patent Owner’s patent disclosure, subject matter of Patent Owner’s patent claims, or Patent Owner’s Infinity device.

Petitioner argues that it did not copy Patent Owner’s invention and identifies technical distinctions between the parties’ products. Pet. Reply 29–30. Petitioner’s expert, Dr. Otto, credibly opines that Petitioner’s choice of red and green light beamers was made for functional reasons (it is easier to get bright LEDs in red and green than in other colors). *Id.* (citing Ex. 1053 ¶¶ 80–81).

Here, Patent Owner lacks any evidence that Petitioner copied the ’253 patent or any claim of the ’253 patent. Patent Owner cites no evidence, for example, that Petitioner was aware of the ’253 patent during development of the H2 device. Patent Owner further lacks evidence that any particular aspect of the ’253 patent was copied. *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995) (“[M]ore than the mere fact of copying by an accused

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infringer is needed to make that action significant to a determination of the obviousness issue.”) (citation omitted).

Patent Owner also lacks evidence that Petitioner copied any patented product. As we explain above, Patent Owner lacks evidence that the Infinity product is coextensive or nearly coextensive with any challenged claim; the record, thus, does not establish that Infinity is a “patented product” in a relevant sense.

Moreover, the Federal Circuit has held that “copying requires evidence of efforts to replicate a specific product, which may be demonstrated through internal company documents, direct evidence such as disassembling a patented prototype, photographing its features, and using the photograph as a blueprint to build a replica, or access to the patented product combined with substantial similarity to the patented product.” *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010). Here, Patent Owner lacks evidence that Petitioner studied any Patent Owner product or documents when developing the H2 device. To the contrary, the preponderance of the evidence supports that Petitioner’s H2 product differs from Patent Owner’s product, including because it refocuses at different distances (a design present in prior art systems). Ex. 1053 ¶¶ 79–81; *see also* Pet. Reply 29.

Thus, based on the record as a whole, Patent Owner’s allegation of copying is unpersuasive and does not support non-obviousness.

3. *Long-Felt Need*

Patent Owner argues that there was a long-felt need which the invention of the ’253 patent addresses. PO Resp. 55–59; PO Sur-reply 26. First, Patent Owner argues that in 2007, it “developed and launched the LifeViz stereophotogrammetry camera,” which “was a portable, handheld,

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single camera device with one pair of beamers converging at the focus distance of the camera, and subjects were imaged at that distance.” PO Resp. 57 (citing Ex. 2019 ¶¶ 9–12).

Second, Patent Owner argues that “[a]t the time of invention [of the ’253 patent], there were no portable, ‘all-in-one’ handheld stereophotogrammetry devices for imaging both face and breast/torso.” *Id.* at 58 (citing Ex. 2019 ¶¶ 25–26, 29). “To image both, practitioners had to purchase one device for face and one for breast/torso, or purchase the large, costly multi-head Canfield XT,” which had disadvantages,” according to Patent Owner. *Id.* (citing Ex. 2019 ¶¶ 25–26, 29; Ex. 1001, 1:49–52).

Patent Owner argues that “[a]ccordingly, since at least the 2007 introduction of LifeViz, there was a long-felt need for a portable single-camera stereophotogrammetry device that avoided the disadvantages of purchasing multiple devices or a multi-head device like the Canfield XT.” *Id.* (footnote omitted) (citing Ex. 2013 ¶ 212; Ex. 2019 ¶ 30; Ex. 2020, 4).

“To address that deficiency, [Patent Owner] developed Infinity in 2015, filed for a patent thereon on October 14, 2015, and began commercial sales one year later,” according to Patent Owner. *Id.* at 59 (citing Ex. 2019 ¶¶ 28–29). Patent Owner argues that its Infinity product satisfied the long-felt need as demonstrated by industry praise and commercial success. *Id.* (citing Ex. 2019 ¶ 30; Ex. 2020, 4). Patent Owner also cites for support Dr. Otto’s deposition testimony that “it ‘was desired to do breast imaging,’ there was ‘a big demand’ to image ‘both areas,[]’ and [Petitioner] ‘didn’t want to have a separate product to do breast imaging.’” PO Sur-reply 26 (citing Ex. 2037, 17:22–18:17).

We find that Patent Owner does not show that there was a long-felt need that the claimed invention addresses. “[L]ong-felt need is analyzed as

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of the date of an articulated identified problem and evidence of efforts to solve that problem.” *Texas Instruments Inc. v. U.S. Int’l Trade Comm’n*, 988 F.2d 1165, 1178 (Fed. Cir. 1993). Patent Owner does not show that the LifeViz product having only one pair of beamers converging at one distance was identified as a problem needing solution in 2007. *See* Ex. 2019 ¶¶ 9–12. Rather, Dr. Thirion testifies to the capabilities of the 2007 LifeViz product. *Id.* That a later generation product, such as Infinity, has additional capabilities does not evidence that a long-felt need existed and was met. Rather, evidence must be provided that shows there was an articulated identified problem and efforts to solve that problem, which Patent Owner does not do. Nor does Patent Owner provide evidence that Infinity was met with skepticism or that persons of ordinary skill in the art tried and failed to achieve the claimed invention.

Nor are we persuaded that industry praise and commercial success alone is sufficient to evidence a long-felt need that the claimed invention addresses. Both can exist without a long-felt need having existed. *See* Ex. 2019 ¶ 30 (testifying that Infinity created a new market for sales, but not providing direct evidence that a long-felt need had existed in the industry); Ex. 2020, 4 (stating that Infinity “is the first portable 3D imaging system capable of capturing face, body, and breast areas thanks to two sets of dual beamer pointers which allow for two distance settings,” but without stating it met a long-felt need). Furthermore, Dr. Otto’s deposition testimony cited by Patent Owner does not evidence that there was a long-felt need that the claimed invention solved. Ex. 2037, 17:22–18:17.

In sum, we find that Patent Owner does not show that there was a long-felt need. Moreover, Patent Owner does not provide analysis to show

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the requisite nexus between the purported long-felt need and the unique characteristics of the claimed invention.

4. *Praise*

Patent Owner argues that Infinity won a prestigious award, the 2018 EuroMediCom Best Aesthetic Device Award, and that this award establishes industry praise. PO Resp. 59. In addition, Patent Owner argues that this award has nexus with the invention. *Id.* To that end, Patent Owner quotes three portions of the EuroMediCom announcement, and argues that “[t]his praise is squarely directed to the claimed invention.” *Id.* at 59–60 (citing Ex. 2020, 4; Ex. 2013 ¶ 214).

Below we produce the entirety of the announcement, and we italicize the portions Patent Owner quotes in its Response.

The LifeViz® Infinity is the first portable 3D imaging system capable of capturing face, body, and breast areas thanks to two sets of dual beamer pointers which allow for two distance settings. This unique system has two acquisition modes. A tripod mounted camera and turntable quickly capture a 360° 3D body image. Eight images are automatically taken and seamlessly stitched to produce a “life-like[”] 3D image of the body for visualization by the physician and patient. In hand-held mode, the camera is capable of generating 3D images of face and breast to simulate procedures and photo-document before/after interventions, without blocking an entire exam room with cumbersome equipment.

With a simple flip of a switch, dual beam pointers adjust to the distance ideal for face or body applications without the need for cumbersome repositioning and/or multi-headed systems. Superior image quality has been achieved by improving the optic performance. The LifeViz® Infinity produces excellent pictures from both near and far thanks to an increased deep field of view. Finally, a powerful external flash removes the need for specific lighting conditions and additional equipment ensuring reproducible images from one session to the next. The LifeViz® Infinity is comprised of a portable stereovision camera, a

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software suite including an image database, 3D viewer tool, 3D skin analysis, face, breast, and body measurements and simulation modules. All aspects of 3D documentation, comparison, simulation, and measurement ranging from medical to cosmetic applications are possible with this single unique device.

Ex. 2020, 4 (*italics* emphases added). As can be seen above, the announcement broadly describes the Infinity product, including many additional features that Patent Owner does not identify, such as “a tripod mounted camera and turntable”; “[e]ight images are automatically taken and seamlessly stitched to produce a ‘life-like’ 3D image of the body for visualization”; “a powerful external flash”; and “a software suite including an image database, 3D viewer tool, 3D skin analysis, face, breast, and body measurements and simulation modules.” *Id.*

Patent Owner does not show that the purported praise is a direct result of the unique characteristics of the claimed invention. The announcement touts additional features of Patent Owner’s Infinity product. Based on the announcement, we cannot assess whether praise for Patent Owner’s product is grounded in a claimed feature, or other features, or a combination thereof. Patent Owner does not directly compare the announcement with the challenged claims, and does not clearly identify what Patent Owner contends are the unique characteristics of the claimed invention being praised. Moreover, the challenged claims are of varying scope, and Patent Owner does not address those differences.

In addition, Patent Owner argues that three “medical professionals’ praise is directed to the claimed invention.” PO Resp. 60–61 (citing

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Ex. 2021,¹⁵ 11, 19–20). In particular, Patent Owner quotes from Dr. Lee’s testimonial that “[a]lthough regular 2D pictures are inconvenient, capturing a face or body in 3D with the 3D LifeViz® Infinity is easier. First of all, you have a unique device for standardized photography with a switch that adjusts the ideal distance for face and body.” *Id.* at 60 (citing Ex. 2021, 19). Patent Owner does not relate this portion of Dr. Lee’s testimonial to the claims, and fails to show that the purported praise is a direct result of the unique characteristics of the claimed invention.

In addition, Patent Owner quotes from the testimonial of Dr. Karimi who states that Infinity is “a state of the art, easy to use photographic system that has become an essential part of our consultation for face and body procedures.” *Id.* at 60 (citing Ex. 2021, 20). And Patent Owner argues that “Dr. Myriam Fopp uses LV Infinity for face (‘Wrinkles, Pores’) and body” and Dr. Fopp states that “[w]e also use our LifeViz® Infinity technology for body treatments.” *Id.* at 60 (citing Ex. 2021, 11). As above, Patent Owner does not relate these portions of Drs. Karimi’s and Fopp’s testimonials to the claims, including failing to show that the purported praise is a direct result of the unique characteristics of the claimed invention.

In sum, we find that Patent Owner does not show sufficient nexus between the purported praise and the claimed invention.

VI. ALLEGED OBVIOUSNESS OVER PLASSMANN, TREUILLET, AND STALLER

Petitioner argues that the combination of Plassmann, Treuillet, and Staller renders claims 1–4, 8–11, 15, 16, and 20 of the ’253 patent obvious. Pet. 5, 28–62. We have reviewed the parties’ arguments and the evidence of

¹⁵ *Testimonials: What our customers say*, QuantifiCare
<https://www.quantificare.com/learn/testimonials/>.

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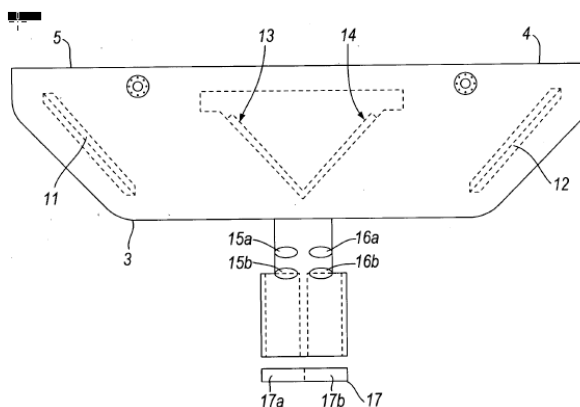
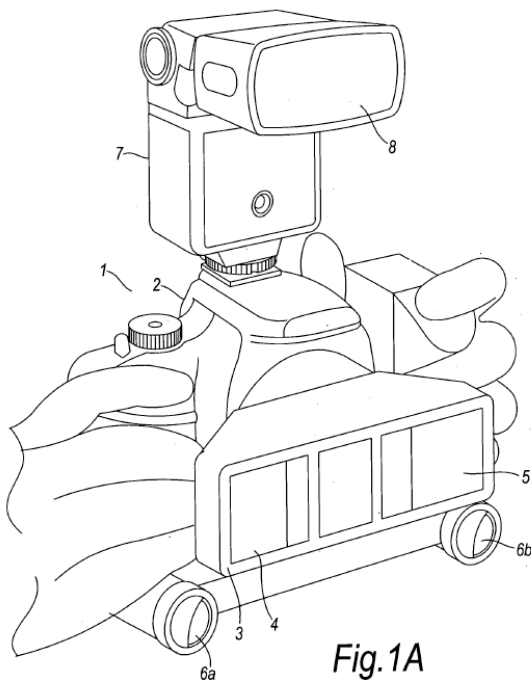
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record, including the indicia of non-obviousness arguments. For the reasons that follow, we determine that Petitioner shows by a preponderance of the evidence that the combination of Plassmann, Treuillet, and Staller renders these claims obvious.

A. Summary of Plassmann

Plassmann is a World Intellectual Property Organization publication that relates to an apparatus for the production of stereoscopic images. Ex. 1007, at codes (10), (19), (57). Plassmann describes variations of the “MAVIS” system. *Id.* at 11:25–28. Plassmann’s apparatus captures “two images [which are] needed to form a stereo image . . . to produce a three-dimensional representation of the subject.” *Id.* at 12:25–29. The apparatus further includes two light emitting diodes (LEDs) emitting respective beams which converge at a particular distance in front of the apparatus. *Id.* at 12:7–13.

Below, we reproduce Plassmann Figures 1A and 1B.



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Figure 1A is a perspective representation of an apparatus for obtaining stereoscopic images, showing body 2 (e.g., a camera) and adaptor 3. *Id.* at 11:3–4, 11:28–12:4. Further Figure 1B shows a “plan view” of adaptor 3 in further detail. *Id.* at 11:5–6, 12:13–14. Adaptor 3 has two apertures 4, 5 which respectively collect light which is respectively focused onto charge coupled device parts 17a, 17b, forming respective first and second images. *Id.* at 12:15–25. The first and second images form a stereo image used to produce a three-dimensional representation of a subject. *Id.* at 12:25–29.

Additionally, as shown in Figure 1A, the apparatus includes

two low-powered light emitting diodes (LEDs) 6a, 6b, each provided with a [focusing] lens to produce a beam of light and being arranged so that the beams converge and meet at a point a fixed and desired distance from the apparatus, this distance corresponding to the distance at which the camera lens is [focused].

Id. at 12:8–13. The converging beams act as “a guide to show distance between the apparatus and subject.” *Id.* at 16:12–14.

B. Summary of Treuillet

Treuillet is a paper that relates to an “approach to build 3-D models of skin wounds from color images.” Ex. 1016, 752. Treuillet explains that “[b]y taking two color images from different points of view, stereophotogrammetry allows the computation of the 3-D coordinates of numerous points on the skin lesion.” *Id.* at 754.

By way of imaging technology background, Treuillet describes the MAVIS II system as “a reflex digital camera equipped with special dual lens optics for recording two images from slightly different viewpoints, generating a stereo pair” which includes “two tube-shaped projectors produce beams of light which intersect in a single spot when the camera is

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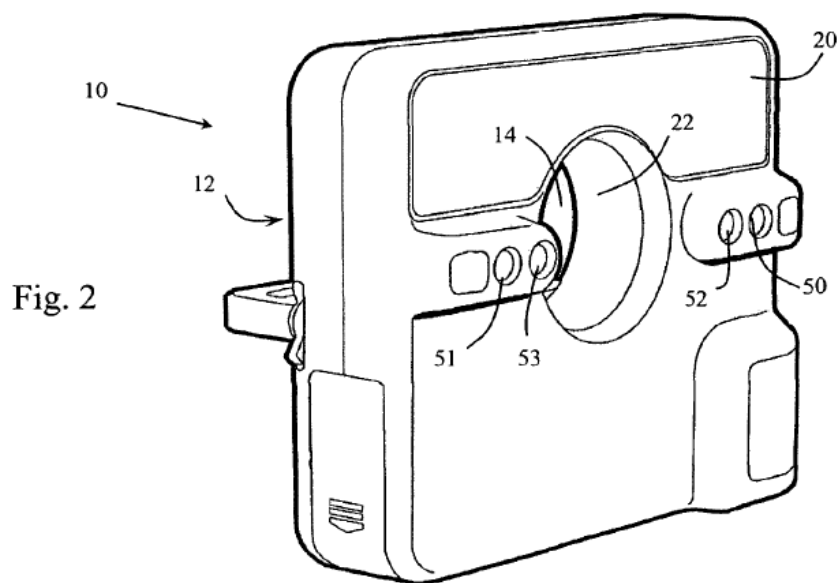
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held at the right distance” at “about 80 cm from the wound,” with a tolerance of plus or minus 15 cm. *Id.* at 755.

C. Summary of Staller

Staller is a US patent that relates to a diffuser attachment for a camera including a “distance measurement device [that] uses a pair of light beams which intersect at a repeatable distance from the diffuser body to readily enable positioning of an object to be photographed at that repeatable distance.” Ex. 1006, code (57).

Below, we reproduce Figure 2, which shows a front perspective view of a diffuser. *Id.* at 3:13–14.



As shown in Figure 2, the diffuser “includes a distance measurement device or indicator in the form of a plurality of light beam emitters 50–53.” *Id.* at 5:13–15. “Each pair of emitters 50–51, 52–53 creates a pair of angled light beams which intersect at different distances in front of diffuser body 12.” *Id.* at 5:17–18. As such, “[e]ach of the pairs of light beams allows diffuser 10 to be relocated at the same repeatable distance from a subject.” *Id.* at 5:18–21;

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see id. Fig. 4. That is, each pair of emitters indicates a different distance. *Id.* at 2:30–35, 5:64–6:2.

Further, either of the emitter pairs, i.e., pair 50–51 or pair 52–53, are selected using a selector switch. *Id.* at 5:38–41. By selecting a particular emitter pair, the distance measurement device indicates a particular distance measurement. *See id.*

D. Challenged Claim 1

1. Device for Stereophotogrammetry (Preamble)

Petitioner argues that Plassmann teaches “[a] device for stereophotogrammetry,” as recited in the preamble of claim 1. Pet. 28–29. More specifically, Petitioner argues that Plassmann teaches “a device for stereophotogrammetry including an adaptor (3) attached to a camera body (2) to capture stereo images.” *Id.* (citing Ex. 1007, Figs. 1A–1B; Ex. 1003 ¶ 229). Petitioner argues that “[t]he adaptor acquires two views of an object from two different angles via mirrors 11 and 12,” and that “Plassmann describes their use to reconstruct a 3-D representation of imaged objects.” *Id.* at 29 (citing Ex. 1007, 12:25–29). According to Petitioner, one of ordinary skill in the art “would understand Plassmann discloses a device for stereophotogrammetry.” *Id.* (citing Ex. 1003 ¶ 230).

After reviewing Petitioner’s arguments and evidence, which are not addressed by Patent Owner (*see generally* PO Resp.), we determine that Petitioner demonstrates by a preponderance of the evidence that Plassmann teaches claim 1’s preamble.

2. Camera Body

Petitioner argues that Plassmann teaches “a camera body (1),” as recited in claim 1. Pet. 29–30. More specifically, Petitioner argues that Plassmann teaches camera body 2. *Id.* (citing Ex. 1007, Fig. 1A; Ex. 1003

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¶ 231). Petitioner adds that Plassmann teaches using “a camera body such as is well-known to those skilled in the art.” *Id.* at 30 (quoting Ex. 1007, 5:29–30, 12:3–4).

After reviewing Petitioner’s arguments and evidence, which are not addressed by Patent Owner (*see generally* PO Resp.), we determine that Petitioner demonstrates by a preponderance of the evidence that Plassmann teaches “a camera body (1).”

3. Double-Optics Comprising Two Sub-Optics

Claim 1 further recites “a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1020, 11:43–45. We agree with Petitioner and find that Plassmann teaches this limitation. Pet. 30–32.

Petitioner annotates Plassmann’s Figure 1B, which is shown below with Petitioner’s annotations. *Id.* at 31.

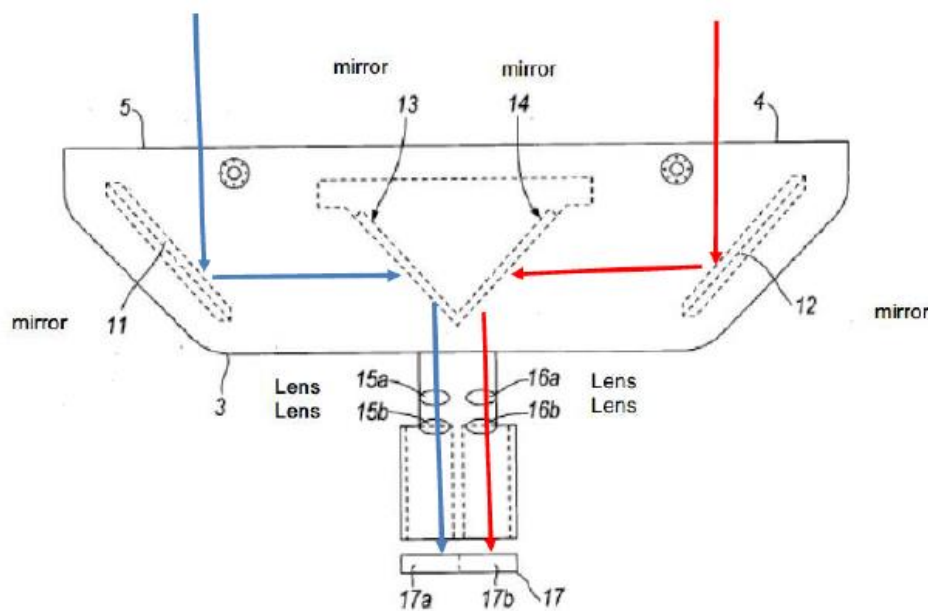


Fig.1B
PRIOR ART

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Plassmann teaches that Figure 1B depicts “a plan view of a known adaptor used in” “a known apparatus for obtaining stereoscopic images.” Ex. 1007, 11:3–6. Petitioner annotates the figure with blue lines indicating an exemplary first light path through aperture 5 to charge coupled device part 17a, which Plassmann describes as follows: “Light passing through aperture 5 hits mirror 11 and then mirror 13 before passing through lenses 15a, 15b. Lenses 15a, 15b focus the light so that, when the shutter of the camera is pressed, light is focussed onto part 17a of a charge coupled device 17 so as to form a first image.” Pet. 30–31 (annotating Ex. 1007, Fig. 1B, citing 12:14–25); Ex. 1007, 12:15–20. Similarly, Petitioner annotates the figure with red lines indicating an exemplary second light path through aperture 4 to charge coupled device part 17b, which Plassmann describes as follows: “[L]ight passing through aperture 4 hits mirror 12 and then mirror 14 before passing through lenses 16a, 16b. Lenses 16a, 16b focus the light so that, when the shutter of the camera is pressed, light is focussed onto part 17b of the charge coupled device 17 so as to form a second image.” Pet. 30–31 (annotating Ex. 1007, Fig. 1B, citing 12:14–25); Ex. 1007, 12:20–25.

We agree with Petitioner and find that one of ordinary skill in the art would have recognized that the combination of mirrors and lenses comprises double-optics employing two sets of sub-optics (*i.e.* 11, 13, 15a, and 15b (blue) and 12, 14, 16a, and 16b (red)). Ex. 1007, 12:14–25, Fig. 1B ; Ex. 1003 ¶ 235; Pet. 32. More specifically, we agree with Petitioner and find that Plassmann teaches having two sub-optics, which are displaced from one another, and which each collect light from the subject to be imaged (viewed). *See, e.g.*, Ex. 1007, 12:14–25, Fig. 1B. Plassmann teaches that the light collected by each sub-optic comprises the light that passes through the respective aperture 4 or 5, and traverses different sets of mirrors and

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lenses to be focused on a different part of a charged coupled device to form respective first and second images (views). *Id.* at 12:14–25, Fig. 1B.

We also agree with Petitioner and find that due to spaced mirrors 11 and 12—which are part of different light paths and which are hit by the light that passes through their respective aperture 4 or 5—the two images (views) are necessarily acquired at different angles. Ex. 1007, 12:14–25, Fig. 1B; Ex. 1003 ¶ 235; Pet. 32. Moreover, each sub-optic receives light from, for example, the center point of the object to be imaged from a different angle due to the spaced mirrors 11 and 12, as well as depending on the curvature of the subject and which point on the subject from which the light originates. *Id.*; *see also* PO Resp. 28 (admitting that “[i]t is true that, when a subject is imaged using a stereophotogrammetry device having two sub-optics, the ‘angle’ between a point of the subject and each sub-optic is different”).

In addition, the ’253 patent Specification describes the claimed double optics as follows: “A double optics (2) adapted to the camera body (1) and composed of two sub-optics (2b) and (2c), enabling the acquisition of a stereo pair corresponding to two slightly different viewing angles.” Ex. 1020, 8:35–38. Notably, the passage provides that having two sub-optics enables acquiring a stereo pair “corresponding to two slightly different viewing angles,” without addressing the sub-optics’ orientation. *Id.*

Lastly, we agree with Petitioner and find that because images (views) are captured using a single camera, one of ordinary skill in the art would have understood they are obtained simultaneously. Ex. 1003 ¶ 235.

We find unavailing Patent Owner’s arguments disputing that Plassmann teaches this limitation. PO Resp. 23–30. Patent Owner’s arguments are premised on its construction (which we do not adopt) of the plain and ordinary meaning for this limitation which excludes parallel view

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sub-optic configurations. *Id.* Put differently, Patent Owner argues that having the sub-optics spaced apart from each other is insufficient to teach “two views according to two different angles.” *Id.* As we discuss above, this is incorrect. Thus, Patent Owner’s discussions regarding the optical axes of the sub-optics and their orientations are inapposite in light of the proper construction for “two views according to two different angles.” *Id.*

Moreover, we afford the testimony of Dr. van der Weide, Patent Owner’s expert, little weight with regard to this issue, as it is based on the incorrect claim construction for “according to two different angles,” and does not explain otherwise a basis for the testimony that the two images are acquired at the same angle. Ex. 2013 ¶¶ 113–141.¹⁶

In sum, we are persuaded that Petitioner demonstrates by a preponderance of the evidence that Plassmann teaches “a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views according to two different angles.”

4. *Wherein the Device is Comprising a Positioning System*

The remaining limitation of claim 1 reads as follows:

wherein the device is comprising a positioning system (34) configured to signal when a target subject (S) is reaching a pre-defined distance position to the camera (1) corresponding to one of at least two distinct pre-defined distance positions (A3, A4) of the target subject (S) relative to the camera body (1) of the stereophotogrammetry device, the at least two distinct predefined distance positions comprising a closer distance position (A4) and a farther distance position (A3), the closer

¹⁶ Petitioner argues that Plassmann and its Figure 3A suggest that its sub-optics are angled inwardly such that this recitation would be met “[e]ven if the Board were to exclude parallel suboptics from the claims.” Pet. Reply 8. It is not necessary to reach this issue because we did not adopt Patent Owner’s construction.

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distance position (A4) being closer to the camera body (1) of the stereophotogrammetry device than the farther distance position (A3) to the camera body (1) of the stereophotogrammetry device.

Ex. 1020, 11:46–57. We agree with Petitioner and find that the combination of Plassmann, Treuillet, and Staller teaches this limitation. First, we agree with Petitioner and find that Plassmann teaches a positioning system that uses a pair of light beamers to signal when a target subject is reaching a predefined distance position to the camera. *See* Ex. 1007, Fig. 1A (light beamers 6a, 6b); Pet. 33. Plassmann teaches that light beams converge at a predefined distance “corresponding to the distance in which the camera lens is focussed.” Ex. 1007, 12:7–13. More specifically, Plassmann states the following:

The apparatus is also provided with two low-powered light emitting diodes (LEDs) 6a, 6b, each provided with a focussing lens to produce a beam of light and being arranged so that the beams converge and meet at a point a fixed and desired distance from the apparatus, this distance corresponding to the distance at which the camera lens is focussed.

Id.; Pet. 34. Accordingly, we find that Plassmann teaches the limitation, save for having a second predefined distance position—if there are two different distance positions, one necessarily is closer to the camera body and the other one farther. Ex. 1007, 12:7–13, Fig. 1A.

Second, we agree with Petitioner and find that Staller teaches a positioning system having more than one predefined imaging distance position. Pet. 38. More specifically, we find that Staller teaches a strobe diffuser attachment for a camera, which includes a “distance measurement device [that] may be adapted to selectively produce one of a plurality of pairs of light beams which intersect at different repeatable distances from the diffuser body.” Ex. 1006, code (57), 2:29–32, 5:13–15; *see also id.* at 5:56–

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6:2 (“[T]wo pairs of light beam emitters . . . may be used to provide three or four separate pairs of intersecting bea[m]s and three or four corresponding repeatable distances for diffuser 10.”); Pet. 38. In other words, Staller teaches having at least two distinct predefined distance positions for the camera. Ex. 1006, code (57), 2:29–32, 5:13–15, 5:56–6:2.

We also agree with Petitioner and find that Staller teaches that its “distance indicator improves the usefulness of close range photography by providing a repeatable scale to photographs[, which] . . . improves the usefulness of close ranges photographs for medical and other organic growth measurement applications.” Ex. 1006, 6:10–15; Pet. 38. In addition, we agree with Petitioner and find that Plassmann teaches that “[s]tereoscopic imaging has been known for many years,” and “ha[s] been used to measure the shape of wounds and the like which are otherwise difficult to measure by conventional techniques.” Ex. 1007, 1:6–15; Pet. 35. We also agree with Petitioner and find that it was known in the art before the ’253 patent to use a camera having multiple predefined distances for imaging a subject in connection with wound or lesion treatment. *See* Ex. 1017,¹⁷ 579; Ex. 1011,¹⁸ 164, Fig. 2, Table 2; Ex. 1008,¹⁹ 481.

Thus, in light of the above, we find that one of ordinary skill in the art would have found it obvious to modify Plassmann’s stereophotogrammetry device, based on what was known in the art, which includes Staller’s

¹⁷ Gwen Clarke, *Recording Wounds: Polaroids New Medically Designed Camera*, British Journal of Community Nursing, vol. 5, no. 11 (Sept. 27, 2013) (“Clarke”).

¹⁸ Melvin A. Shiffman, *A New Camera for Cosmetic Surgery*, The Am. J. Cosmetic Surgery, vol. 15, no. 2 (June 1, 1998) (“Shiffman”).

¹⁹ Clare Williams, *Wound care assessment with the Polaroid Macro 3 SLR*, British J. Community Nursing, vol. 6, no. 9 (2001) (“Williams”).

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teachings, to have multiple predefined distance positions for repeatability. Plassmann already teaches use of one pair of light beams for positioning, and a person of skill in the art would have understood that the Plassmann device could benefit from multiple pairs of light beams in the same way the Staller device benefits from the multiple pairs of light beams to enable positioning at more than one repeatable distance from the camera. Ex. 1003 ¶¶ 138–139; *KSR*, 550 U.S. at 417 (“[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.”).

We find unavailing Patent Owner’s arguments that Plassmann’s camera needs to be “optimally focused,” which occurs at a single fixed distance, and thus, one of ordinary skill in the art would not add a second distance. PO Resp. 31–36; PO Sur-reply 17–20 (making similar arguments that optimal focus to ensure precision and accuracy of the image of a wound).²⁰ We also find unavailing Patent Owner’s argument that Plassmann teaches “**the** distance at which the camera lens is focussed,” and thus, one of ordinary skill in the art would understand that Plassmann “refers to the

²⁰ Patent Owner refers to Exhibits 2039 and 2040 in its Sur-reply. Patent Owner used these exhibits (which Petitioner served on Patent Owner, but did not file in this proceeding) during a deposition of Dr. Otto, and filed them in this proceeding with its Sur-reply, which is late under our Rules. See Paper 41 (Order), 3 (authorizing refiling of exhibits to correct numbering, but stating that “this order does not address the merits of whether or not the exhibits at issue are proper”). We consider these exhibits in evaluating Dr. Otto’s testimony, but “not as evidence supporting [Patent Owner’s] arguments on the merits.” *Ascend Performance Materials Operations LLC, v. Samsung SDI Co.*, IPR2020-00349, Paper 53, at 12 (PTAB. July 15, 2021). Regardless, the disclosures in these exhibits do not change our depth of field analysis.

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singular distance where the lens is optimally-focused.” PO Resp. 34–35 (quoting Ex. 1007, 12 (alteration in original); citing Ex. 2013 ¶ 152).

These arguments are contrary to the well-known concept of “depth of field.” As both parties’ experts and the ’253 patent acknowledge, depth of field is the region in which an image is focused or sharp. *See* Ex. 1003 ¶ 37 (quoting Ex. 1001, 6:15–16²¹) (“Like any camera, stereophotogrammetry devices employ lenses that provide a certain depth of field. This depth of field is ‘the distance separating the two planes within which the image is focused.’”); Ex. 2006 ¶ 47 (quoting Ex. 1020, 4:20–24) (“[T]he two predefined distances are included within . . . the space within which the image is sharp, that is . . . the depth of field.”). And Plassmann’s teaching of “the” distance refers to where the beams converge at the pre-defined distance where there is focus (i.e., within the depth of field), rather than limiting the depth of field to a single point of focus. Ex. 1007, 12 (“[T]he beams converge and meet at a point a fixed and desired distance from the apparatus, this distance corresponding to the distance at which the camera lens is focussed.”).

Moreover, stereophotogrammetry devices having sufficient depth of field were known in the art. Ex. 1003 ¶¶ 113, 115, 385; Pet. Reply 19; *see Randall Mfg. v. Rea*, 733 F.3d 1355, 1362–63 (Fed. Cir. 2013) (providing that it is appropriate to consider such knowledge as part of an obviousness analysis). For example, Treuillet teaches with respect to the MAVIS II stereophotogrammetry device that “[t]o simplify the image capture, two tube-shaped projectors produce beams of light which intersect in a single

²¹ Dr. Otto quotes from the Specification of the ’119 patent, which is the parent of the ’253 patent and shares a common Specification. In the ’253 patent, this passage is contained within lines 20–24 of column 4.

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spot when the camera is held at the right distance (about 80 cm from the wound),” and that “[e]xact positioning is not required: images can be taken in a volume of ± 15 cm around this point.” Ex. 1016, 755. This teaching that exact positioning is not required, and that images can be taken within a 30 cm region evidences the depth of field for the MAVIS II. Ex. 1016, 755; Ex. 1053 ¶¶ 55–56.

We find unavailing Patent Owner’s argument that Treuillet’s teaching that the beams of light intersect at “the right distance” equates to “the distance of optimal focus or where the image is sharpest,” and limits the MAVIS II to using that distance. PO Resp. 36 (citing Ex. 1016, 755; Ex. 2013 ¶ 154). This teaching refers to reaching the pre-defined distance, rather than limiting the depth of field. Ex. 1016, 755. We also find unavailing Patent Owner’s arguments that Treuillet teaching that “images can be taken in a volume of ± 15 cm” does not teach a depth of field, and that “[c]an’ is not ‘should.’” PO Resp. 41–42 (citing Ex. 2013 ¶¶ 180–182). This teaching directly corresponds to what depth of field means and “can” expresses that capability of taking focused images within the depth of field. Ex. 1016, 755; Ex. 1003 ¶ 37; Ex. 2006 ¶ 47; Ex. 1001, 6:15–16; Ex. 1020, 4:20–24.

In addition, Hoeffelin²² teaches a stereophotogrammetry device having a 40 cm depth of field, which is sufficient to image both the face and torso. *See* Ex. 1015, 8–9 (disclosing “that the focal length needs to be respected (between 80 and 120 cm)”; Ex. 1003 ¶ 169; Ex. 1053 ¶ 61. We find unavailing Patent Owner’s argument that Hoeffelin teaches that “the

²² H. Hoeffelin, et al., *A Methodological Evaluation of Volumetric Measurement Techniques including Three-Dimensional Imaging in Breast Surgery*, BioMed Research Int’l, vol. 2014, 8 (Jan. 2014) (Ex. 1015).

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focal length needs to be respected,” or otherwise brings risk of distortion. PO Resp. 36–37 (citing Ex. 1015, 8–9; Ex. 2013 ¶ 156). Patent Owner ignores the “(between 80 and 120 cm)” range that immediately follows and modifies the focal length statement, and expresses a depth of field. Ex. 1015, 8–9.

Moreover, we find unavailing Patent Owner’s arguments to the extent that they focus only on Plassmann’s depth of field. *See* PO Resp. 31–36; PO Sur-reply 17–20. These arguments are directed to Plassmann’s teachings individually, which is the incorrect focus. *Cf. In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (“Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references”); *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). In addition, these arguments are akin to arguing that Plassmann and Treuillet’s teachings cannot be physically combined, which is an improper focus for determining non-obvious. *See Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (quoting *In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983)); *see also id.* (quoting *In re Etter*, 756 F.2d 852, 859 (Fed. Cir. 1985) (en banc)) (“Etter’s assertions that Azure cannot be incorporated in Ambrosio are basically irrelevant, the criterion being not whether the references could be physically combined but whether the claimed inventions are rendered obvious by the teachings of the prior art as a whole.”).

We also find unavailing Patent Owner’s argument that that there would be no reason to combine Staller’s teachings with Plassmann because Plassmann has no need for additional beamers to provide repeatable scale. PO Resp. 38. More specifically, Patent Owner argues that “with Plassmann, the scale of the 3D reconstruction is already known exactly from the

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calibration and triangulation methodology,” and “[t]herefore, Plassmann already enables wound images to be viewed over successive examinations at repeatable scale(s) and at varying levels of magnification.” *Id.* (citing Ex. 2013 ¶ 165). Even if, as Patent Owner argues, one of ordinary skill in the art could develop or utilize different solutions to address scale, this does not make Staller’s solution less obvious. *Cf. Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (“[A] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.”). Moreover, the ability to consistently take images from different positions using multiple beamers would still have utility.

We also find unavailing Patent Owner’s argument that “Treuillet criticizes MAVIS II, calling it ‘cumbersome’ and stating ‘all the previous systems are unsuitable for general use in clinical settings.’” PO Resp. 43 (quoting Ex. 1016, 752, 755, 761). Patent Owner further argues that Treuillet criticizes that Plassmann’s MAVIS II requires “careful calibration.” *Id.* at 44. These arguments, however, do not undermine our finding above that a person having ordinary skill in the art would have understood that the MAVIS II device had a useable depth of field and that Plassmann would benefit from having multiple positioning beamers within that depth of field. Treuillet does not denigrate the notion of using multiple beamers with MAVIS II. *Cf. In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004) (“The prior art’s mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the [claimed solution].”).

In summary, we are persuaded that Petitioner (i) demonstrates by a preponderance of the evidence that the combination of Plassmann, Treuillet,

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and Staller teaches this limitation, and (ii) provides sufficiently articulated reasoning with rational underpinning to support Petitioner’s combining of Plassmann, Treuillet, and Staller’s teachings for this limitation. *See Kahn*, 441 F.3d at 988 (citations omitted), *cited with approval in KSR*, 550 U.S. at 418.

5. *Summary*

In summary, we determine that Petitioner shows by a preponderance of the evidence that claim 1 would have been obvious to one of ordinary skill in the art in view of the combination of Plassmann, Treuillet, and Staller.

E. Challenged Claims 2–4, 8, 9, 15, 16, and 20

Petitioner argues that the combination of Plassmann, Treuillet, and Staller teaches the limitations recited in claims 2–4, 8, 9, 15, 16, and 20. Pet. 42–50, 58–62. Patent Owner’s Response does not separately address Petitioner’s arguments directed to these claims. PO Resp. 46.

Based on the evidence and arguments of record, we find that Petitioner demonstrates by a preponderance of the evidence that claims 2–4, 8, 9, 15, 16, and 20 would have been obvious to one of ordinary skill in the art over the combination of Plassmann, Treuillet, and Staller.

F. Challenged Claim 10

Claim 10 recites “[t]he device according to claim 1 wherein the closer distance position (A4) and the farther distance position (A3) are such that a surface of a field of view corresponding to the farthest distance position (A3) is at least 25% larger than a surface of a field of view corresponding to the closer point position (A4).” Ex. 1020, 12:53–58. To address this recitation, Petitioner argues that it would have been obvious to a person

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having ordinary skill in the art to define a farther position 25% larger than the closer position. Pet. 51. Petitioner persuasively argues that Plassmann and Treuillet both disclose that Plassmann could be used for wound monitoring. *Id.* at 51–52. Petitioner also persuasively argues that a person of ordinary skill in the art would have understood that wound-monitoring devices could employ close and far positions which differ in magnification by more than 200%. *Id.* A preponderance of the evidence including the Clarke reference evidences this point. Ex. 1017, 579–80; Ex. 1003 ¶ 286.

Petitioner further argues a person having ordinary skill in the art would have also understood that a Plassmann-type stereophotogrammetry device could be used for imaging face or breasts. Pet. 52. A preponderance of the evidence also supports this position. The '253 patent acknowledges that separate stereophotogrammetry devices had been used for 3D reconstructions of face and breasts in A3 and A4 surface format. Ex. 1020, 1:46–59; Ex. 1003 ¶ 287.

Petitioner's expert, Dr. Otto, calculates that Plassmann's 30-centimeter depth of field would be sufficient to encompass a "surface field of view" equivalent to the A4 format and equivalent to the A3 format (different by more than 25%). Pet. 52–53 (citing Ex. 1003 ¶ 289). Dr. Otto also testifies that, while Plassmann and Treuillet do not disclose focal length of the Plassmann device's lenses, a person having ordinary skill in the art would understand that different lenses could be employed to achieve different results. *Id.* at 53 (citing Ex. 1003 ¶¶ 164–172, 291–292). Dr. Otto further explains that a person of ordinary skill would have known how to configure a Plassmann device to take both A3 and A4 formats within the depth of field of the Plassmann device. *Id.* at 53–54. Dr. Otto further explains that a person of ordinary skill would have understood that any

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suitable lens could be used to achieve imaging goals. *Id.* at 53–54 (citing Ex. 1003 ¶ 290); *see also id.* (citing Ex. 1003 ¶¶ 164–172, 291–292).

Petitioner further argues that a person having ordinary skill in the art would have known that similar stereophotogrammetry devices could image face and bodies, such as the LifeViz II device. Pet. 54–55; Ex. 1014,²³ 2 (depicting images of faces and breasts using LifeViz II); Ex. 1003 ¶¶ 168, 292. Petitioner argues that Hoeffelin teaches that LifeViz II has a depth of field from 80–120 cm and that a person of ordinary skill in the art would have thus understood that a 40-centimeter depth of field would be sufficient to encompass A4 format and 100% larger A3 format. Pet. 55–56 (citing Ex. 1003 ¶¶ 170–171, 292; Ex. 1015, 8–9). Dr. Otto confirmed that such a device could encompass these formats. *Id.* at 56 (citing Ex. 1003 ¶¶ 171, 292).

Patent Owner argues that Otto’s analysis and conclusions are flawed. PO Resp. 46–54; PO Sur-reply 22–25. More specifically, Patent Owner argues, as Petitioner acknowledges, that neither Plassmann nor Treuillet disclose the actual focal length of the lenses, and Patent Owner argues that this means neither references teaches “field of view.” PO Resp. (citing Ex. 2013 ¶¶ 192–193; Ex. 1003 ¶ 290). Patent Owner, thus, emphasizes that Dr. Otto relies on replacing Plassmann’s lenses to reach A4 and A3 formats. *Id.* at 47.

Patent Owner then argues that Otto’s calculations and approach err because they are based on a single pyramidal view rather than considering, as necessary for stereophotogrammetry, the intersection of two separate view frustums. *Id.* at 48. Patent Owner’s witness, Dr. van der Weide,

²³ 3D LifeViz website (Jan. 31, 2014).

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explains this purported error. Ex. 2013 ¶¶ 196–199. Patent Owner further argues that depth of field is controlled by lens aperture and that Dr. Otto could not evaluate Plassmann’s depth of field without lens aperture dimensions. PO Resp. 49–50 (citing Ex. 2013 ¶ 200).

Patent Owner also argues that, even under Dr. Otto’s calculations, the subject would have to be imaged 64.5 cm from the camera which is outside of the 65–95 cm depth of field Dr. Otto calculates. *Id.* at 50 (citing Ex. 1003 ¶ 164; Ex. 2013 ¶ 201).

Patent Owner also disputes that Petitioner and Dr. Otto correctly contend that LifeViz II could image the face and torso. *Id.* at 50–53. Patent Owner emphasizes that the face image is from a QuantifiCare advertisement while the torso image is from Hoeffelin, which uses a different camera. *Id.* (citing Ex. 1014, 1–2; Ex. 1015, 2–4; Ex. 2013 ¶¶ 204–205; Ex. 2019 ¶¶ 20–24). Patent Owner further argues that Hoeffelin only provides focal length rather than depth of field. PO Resp. 53 (citing Ex. 1005, 8–9; Ex. 1015, 4; Ex. 2013 ¶ 206).

Patent Owner then argues that, because of Dr. Otto’s analytic errors, Petitioner has not shown that modified devices would meet claim 10 or that a person having ordinary skill in the art could determine how to modify the devices with a reasonable expectation of success. *Id.* at 54.

Considering all of evidence before us, the preponderance of the evidence supports that a person having ordinary skill in the art would have had reason to configure Plassmann as claim 10 recites (to be able to take both face and breast stereo-photos) and would have understood how to employ suitable lenses and focus distances to achieve claim 10’s field of view. We find Dr. Otto’s testimony credible and Petitioner’s position persuasive based on the evidence the Petition cites.

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In particular, the preponderance of the evidence suggests that a person of skill in the art would have known the benefit of creating stereophotogrammetric 3-D images of both faces and breasts. *See* Ex. 1020, 1:56–59 (disclosing a specialist creates images of faces and breasts); Ex. 1014, 2 (suggesting that LifeViz device can create 3-D face image); Ex. 1015, 3 (suggesting LifeViz device can create 3-D breast images). The preponderance of the evidence further supports that a person having ordinary skill in the art would have known that the device described by Plassmann and Treuillet could be configured to create these images with a reasonable expectation of success by making use of various lenses, focal lengths, depths of field, and so forth to define closer and farther imaging positions as desired and, in particular, to reach the recitations of claim 10 for face and breast imaging. Pet. 54; Ex. 1003 ¶ 172; Ex. 1053 ¶¶ 69–74.

Patent Owner’s argument that Dr. Otto miscalculates the precise adjustments that would allow such imaging (PO Resp. 46–55) do not undermine Petitioner’s rationale as to why a person having ordinary skill in the art would combine the references’ teachings to reach claim 10 or would have reasonable expectation of success reaching claim 10. As Petitioner points out, Patent Owner lacks evidence that would undermine Petitioner’s position that such a device would have been desired and achieving such a device would have been within the ordinary skill in the art. Pet. Reply 21. Thus, the preponderance of evidence as to this more general proposition remains true even if Patent Owner were correct that Dr. Otto’s precise calculations were in error. Petitioner does not have a burden to provide precise dimensions of an obvious device within the scope of claim 10. Rather, Petitioner needs to show that a person having ordinary skill in the art would have had both reason and reasonable expectation of success as to

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reaching claim 10's recitations. As we explain above, Petitioner meets this burden.

In sum, we find that Petitioner demonstrates by a preponderance of the evidence that claim 10 would have been obvious to one of ordinary skill in the art over Plassmann, Treuillet, and Staller.

G. Challenged Claim 11

Claim 11 recites the following:

The device according to claim 1 wherein the field of view corresponding to the closer distance position (A4) is equal to a normalized surface format A4, that is 21 cm times 29.7 cm, with possible variation of plus or minus 40% of a surface of the normalized surface format A4 and the field of view corresponding to the farther distance position (A3) is equal to a normalized surface format A3, that is 29.7 cm times 42 cm, with possible variation of plus or minus 40% of a surface of the normalized surface format A3.

Ex. 1020, 12:59–67. For largely the same reasons as claim 10, Petitioner argues that it would have been obvious to a person having ordinary skill in the art to select a field of view that corresponds to A3 surface format and a second field that corresponds to A4. Pet. 56–58. Patent Owner argues that Petitioner does not meet its burden for the same reasons as claim 10. PO Resp. 55. As we explain above, the preponderance of the evidence supports Petitioner's position. *See also* Ex. 1003 ¶ 295–298 (Dr. Otto addressing claim 11).

In sum, we find that Petitioner demonstrates by a preponderance of the evidence that claim 11 would have been obvious to one of ordinary skill in the art over Plassmann, Treuillet, and Staller.

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VII. ALLEGED OBVIOUSNESS OVER PLASSMANN,
TREUILLET, STALLER, AND KINGSLAKE

Petitioner argues, with specific cites to the record, that the combination of Plassmann, Treuillet, Staller, and Kingslake teaches the limitations recited in claim 12. Pet. 63–67. Patent Owner’s Response does not separately address Petitioner’s arguments directed to this claim. PO Resp. 67.

Based on the evidence and arguments of record, we find that Petitioner demonstrates by a preponderance of the evidence that claim 12 would have been obvious to one of ordinary skill in the art over the combined teachings of Plassmann, Treuillet, Staller, and Kingslake.

VIII. ALLEGED OBVIOUSNESS OVER PLASSMANN,
TREUILLET, STALLER, AND PENG

A. *Legal Sufficiency of the Petition*

Patent Owner argues that the Petition is legally deficient because in a related district court litigation Petitioner argued that claims 21–23 contained terms subject to Section 112(f), but Petitioner here fails “to inform the Board that Petitioner contends these terms are subject to Section 112(f), or provide constructions or identify the specific portions of the specification describing the corresponding acts.” PO Resp. 67–68; PO Sur-reply 29–30. Patent Owner argues that Petitioner thereby violates 37 C.F.R. § 42.104(b). PO Resp. 67–68.

Patent Owner’s arguments are unpersuasive. In this *inter partes* review, Petitioner argues that express construction is not necessary for any claim term. Pet. 16. This is sufficient under our Rules. *See* CTPG 44 (“[A] petitioner may include a statement that the claim terms require no express construction.”). Patent Owner does not identify any requirement that

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Petitioner must take a claim construction position in this proceeding that is identical to a position taken in a still pending district court litigation. An inconsistency, however, can weigh against an argument on how to construe a claim term. Here, however, Patent Owner does not argue that Section 112(f) actually should apply to any claim term.

In addition, we do not find persuasive Patent Owner's reliance on *Orthopediatrics Corp. v. K2M, Inc.*, IPR2018-01548, Paper 9, at 9–12 (PTAB Mar. 1, 2019). This Board decision is non-precedential and we find that under the facts here. For example, in *Orthopediatrics Corp.*, the construction of the term was in dispute, which is not the situation here as neither party argues Section 112(f) applies. Paper 9, at 9. And the petitioner in *Orthopediatrics Corp.* argued, *inter alia*, that its “petition is based on the claim constructions urged by Patent Owner in the related district court litigation,” but failed to “set forth Patent Owner's position in the related [d]istrict [c]ourt litigation.” *Id.* at 9–10.

In sum, we do not find that the Petition in this proceeding is insufficient under 37 C.F.R. § 42.104(b).

B. Challenged Claims 21 and 22

Petitioner argues, with specific cites to the record, that the combination of Plassmann, Treuillet, Staller, and Peng teaches the limitations recited in claims 21 and 22. Pet. 67–77. Patent Owner's Response does not separately address Petitioner's arguments directed to these claims. PO Resp. 67.

Based on the evidence and arguments of record, we find that Petitioner demonstrates by a preponderance of the evidence that claims 21 and 22 would have been obvious to one of ordinary skill in the art over the combined teachings of Plassmann, Treuillet, Staller, and Peng.

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C. Challenged Claim 23

Petitioner argues that the combination of Plassmann, Treuillet, Staller, and Peng renders claim 23 obvious. Pet. 78–79. Claim 23 depends from claim 15, which depends from independent claim 1. Ex. 1020, 13:23–34, 14:49–15:5. Claims 15 and 23 are reproduced below.

15. A method comprising using the stereophotogrammetry device according to claim 1, comprising:

moving the stereophotogrammetry device (1) and a target subject (S) (200) so that the positioning system (34) signals that one of the at least two pre-defined distance positions between the camera (1) and the target subject (S) is reached, such signal being the superimposition of beamers on the target subject (S) or the emission of an electromagnetic, acoustic or any other type of signal; and

taking one or several stereo-pairs at the same pre-defined distance position (300).

23. The method according to claim 15 comprising selecting (100):

Either the closer distance position (A4), and then placing a face of a target subject (S) at the closer distance position, and then taking several stereo-pairs of the face of the target subject (S) at the closer distance position, processing these stereo-pairs to reconstruct 3-Dimensional surfaces of the face of the target subject (S), then matching these different 3-Dimensional surfaces in space and finally stitching together these different 3-Dimensional surfaces into a comprehensive 3-Dimensional surface representation (710) of the face of the target subject (S); or

the farther distance position (A3), and then placing a torso of a target subject (S) at the farther distance position, and then taking several stereo-pairs of the torso of the target subject (S) at the farther distance position, processing these stereo-pairs to reconstruct 3-Dimensional surfaces of the torso of the target subject (S), then matching these different 3-Dimensional surfaces in space and finally stitching together these different 3-

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Dimensional surfaces into a comprehensive 3-Dimensional surface representation (720) of the torso of the target subject (S).

Id.

For claim 23, Petitioner relies on, *inter alia*, its arguments it made for certain of the other challenged claims, such as for claims 1, 10, 11, and 15. Pet. 78–79.

Patent Owner argues that Petitioner fails “to prove that [one of ordinary skill in the art] would create a device having surfaces of fields of view capable of imaging both the face and torso as per claim 23.” PO Resp. 69–70 (footnote omitted) (citing PO Resp. 46–54; Ex. 2013 ¶ 228). Patent Owner relies on its arguments for claims 10 and 11 for support.

We are not persuaded by Patent Owner’s arguments. In particular, we address above the parties’ arguments directed to claims 10 and 11, and find that Petitioner shows that the combination of Plassmann, Treuillet, and Staller renders claims 10 and 11 obvious. *See supra* Sections VI(F)–(G). We also find above that Petitioner has shown that claims 1 and 15 are rendered obvious. *See supra* Sections VI(D)–(E).

Accordingly, based on the evidence and arguments of record, we find that Petitioner demonstrates by a preponderance of the evidence that claim 23 would have been obvious to one of ordinary skill in the art over the combined teachings of Plassmann, Treuillet, Staller, and Peng.

IX. PATENT OWNER’S MOTION TO EXCLUDE

Patent Owner’s Motion to Exclude seeks to exclude two areas of evidence. We address each in turn.

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A. Exclusion of Dr. Otto's Testimony to the Extent it Espouses and Relies on Inadmissible Hearsay

Patent Owner argues that testimony of Petitioner's witness, Dr. Otto, should be excluded to the extent Dr. Otto relies on statements regarding the depth of field of the MAVIS II system discussed in Treuillet because Treuillet's statements are hearsay and not the kinds of fact an expert would reasonably rely upon. Mot. Excl. 1–13. Patent Owner further argues that Treuillet's description of MAVIS II is inconsistent with Plassmann's writings concerning MAVIS II and should be excluded for this reason as well. *Id.* at 13–14.

Patent Owner's arguments for exclusion are unpersuasive for at least three reasons. First, as Petitioner argues in opposition to the motion to exclude, Treuillet is admissible as prior art. Opp. Mot. Excl. 2–3. Petitioner and Dr. Otto rely on Treuillet for what the Treuillet reference teaches to a person having ordinary skill in the art at the relevant time. Treuillet's suggestions to a person having ordinary skill in the art remain relevant even if Treuillet were factually incorrect in some respects.

Second, even if considered hearsay, Dr. Otto properly relied on Treuillet. Opp. Mot. Excl. 4–7. Under Federal Rule of Evidence 703, an expert may rely on facts and data that “need not be admissible,” including hearsay (double or otherwise). Here, the evidence supports that Treuillet was published in an independent, respected, and peer-reviewed IEEE journal. *Id.* at 5–6 (citing evidence regarding reliability of the IEEE journal). In addition, we find unavailing Patent Owner's arguments concerning “Reference 45.”²⁴ Mot. Excl. 3–5; Reply Mot. Excl. 1–5.

²⁴ Treuillet cited this reference as follows: “MAVIS II: 3-D wound instrument measurement Univ. Glamorgan, 2006 [Online].

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Rather, we find that it is appropriate for an expert also to rely on the sourcing in article published in such an IEEE journal. Thus, Treuillet is the kind of evidence we would expect an expert witness or person having ordinary skill in the art to rely upon, and Dr. Otto was entirely reasonable on relying on Treuillet in forming his opinions.

Third, even if Treuillet were inconsistent with other evidence, such as Plassmann, this issue would go to the credibility of Dr. Otto's testimony and the weight given to it in deciding ultimate issues of fact rather than admissibility in the first instance.

For the reasons above, we deny Patent Owner's motion to exclude with respect to Dr. Otto's testimony.

B. Exhibits 1018, 1019, 1026, 1033, and 1034

Patent Owner seeks to exclude Exhibits 1018, 1019, 1026, 1033, and 1034 because "the Petition does not cite or otherwise rely on them." Mot. Excl. 15. Petitioner argues that it relied on Exhibits 1026, 1033, and 1034. Opp. Mot. Excl. 12.

In rendering our decision, we only consider Petitioner's evidence to the extent it is properly presented in the Petition or the Reply. We consider Petitioner's evidence that Dr. Otto cites only to the extent explanation of the evidence is properly presented in the Petition or the Reply or only for purposes of assessing whether Dr. Otto's testimony presented in the Petition or the Reply is well-grounded. As such, resolution of Patent Owner's motion to exclude with respect to these exhibits would have no affect our decision making.

Available: <http://www.imaging.research.glam.ac.uk/projects/wm/mavis/>." Ex. 1016, 762.

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For the reasons above, we dismiss as moot Patent Owner's motion to exclude these exhibits.

X. PATENT OWNER'S OBJECTIONS TO PETITIONER DEMONSTRATIVES

Patent Owner objects to certain of Petitioner's demonstratives for oral argument because, for example, the demonstratives constitute evidence that Petitioner did not reference or discuss in a prior paper, according to Patent Owner. *See, e.g.*, PO Objs. 2. Patent Owner also objects to certain demonstratives as mischaracterizing the record. *Id.* at 1.

Demonstratives for oral argument are not evidence, and we do not rely on demonstratives as evidence in our decision making. Paper 45, 3. Because demonstratives are not evidence and we do not rely on them in making our decision, Patent Owner's objections to the demonstratives likewise do not affect our decision making and are therefore moot.

XI. CONCLUSION²⁵

Based on the full record, we determine that Petitioner shows by a preponderance of the evidence that (i) claims 1–4, 8–11, 15, 16, and 20 are unpatentable over Plassmann, Treuillet, and Staller; (ii) claim 12 is unpatentable over Plassmann, Treuillet, Staller, and Kingslake; and

²⁵ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

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(iii) claims 21–23 are unpatentable over Plassmann, Treuillet, Staller, and Peng.

Claim(s)	35 U.S.C. §	Reference(s) /Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–4, 8–11, 15, 16, 20	103	Plassmann, Treuillet, Staller	1–4, 8–11, 15, 16, 20	
12	103	Plassmann, Treuillet, Staller, Kingslake	12	
21–23	103	Plassmann, Treuillet, Staller, Peng	21–23	
Overall Outcome			1–4, 8–12, 15, 16, 20–23	

XII. ORDER

In consideration of the foregoing, it is hereby

ORDERED that, pursuant to 35 U.S.C. § 314(a), Petitioner has shown by a preponderance of the evidence that claims 1–4, 8–12, 15, 16, and 20–23 of the '253 patent are unpatentable;

FURTHER ORDERED that Patent Owner's Motion to Exclude (Paper 46) is *denied* with respect to evidence addressed by Section IX.A, *supra*, and is *dismissed as moot* with respect to evidence addressed by Section IX.B, *supra*;

FURTHER ORDERED that Patent Owner's Objections to Petitioner's Demonstratives are *overruled*; and

FURTHER ORDERED that parties to the proceeding seeking judicial review of this Final Written Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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Paper 60
Date: March 17, 2023

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CANFIELD SCIENTIFIC, INC.,
Petitioner,

v.

QUANTIFICARE S.A.,
Patent Owner.

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Patent 10,681,334 B2

Before BRIAN J. McNAMARA, JOHN D. HARMANN, and
BRIAN D. RANGE, *Administrative Patent Judges*.

McNAMARA, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
Denying In Part and Dismissing In Part Patent Owner's Motion to Exclude
35 U.S.C. § 318(a)

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Patent 10,681,334 B2

I. BACKGROUND

On March 21, 2022 we instituted an *inter partes* review of claims 1–5, 9–12, 15, 16, and 20–23 of U. S. Patent No. 10,681,334 B2 (“the ’334 Patent”), from a Petition (Paper 1, “Pet.”) filed September 8, 2021. Paper 15 (“Dec. to Inst.”). Patent Owner filed a Patent Owner Response (Paper 20, “PO Resp.”), Petitioner filed a Petitioner Reply (Paper 29, “Reply”) and Patent Owner filed a Sur-reply (Paper 41, “Sur-reply”). Patent Owner also filed a Motion to Exclude (Paper 45, “Mot. to Excl.”), Petitioner filed an Opposition to Patent Owner’s Motion to Exclude (Paper 46, “Opp. Mot. Excl.”) and Patent Owner filed a Reply to Petitioner’s Opposition (Paper 52, “PO Reply to Opp.”). A transcript of an oral hearing held on December 14, 2022 (Paper 59, “H’rg. Tr.”) has been entered into the record.

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. §318(a). We base our decision on the preponderance of the evidence. 35 U.S.C. § 316(e) (2018); 37 C.F.R. § 42.1(d).

Having reviewed the arguments of the parties and the supporting evidence, we conclude that Petitioner has demonstrated by a preponderance of the evidence that all the challenged claims are unpatentable.

II. THE ’334 PATENT

The ’334 patent is titled “Device and Method to Reconstruct Face and Body in 3D.” Ex. 1022, code (54). The challenged patent relates to a stereophotogrammetry device used “to picture and reconstruct in 3D the surface of objects of different sizes,” e.g., different body parts such as the face and the torso. *Id.* at 3:42–43; *see id.* at 1:30–42, 1:60–67. By way of background, the ’334 patent explains that “[s]tereophotogrammetry consists in [simultaneously] gathering the images of a subject from at least two view

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with a calibrated camera,” i.e., a “stereo-pair.” *Id.* at 1:43–48. The stereo-pair is used to “reconstruct . . . a dense representation in 3-Dimensions of the surface of the observed object.” *Id.* at 1:49–51. The ’334 patent states that “the device and method according to the disclosure are specifically intended to acquire with a single portable stereophotogrammetry camera views of subjects at two distinct distances” for “reconstruction in 3D of comprehensive representation of the head on one side of the subject and of the torso on the other side of the subject” to meet the “needs of plastic surgeons and aesthetic dermatologists with a single and portable imaging device.” *Id.* at 11:43–50.

Figures 1 and 2, reproduced below, respectively show side- and top-views of an “implementation” of a stereophotogrammetry device and its components. *Id.* at 3:66–4:2.

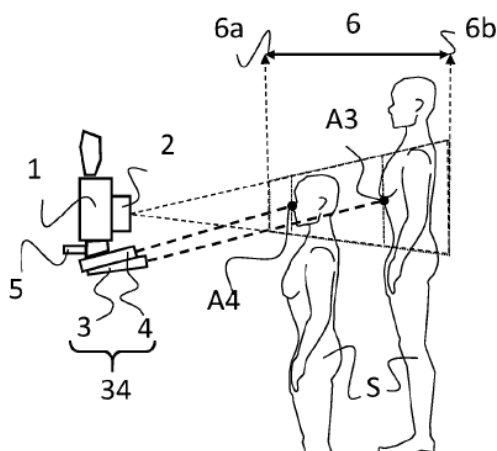


FIG. 1

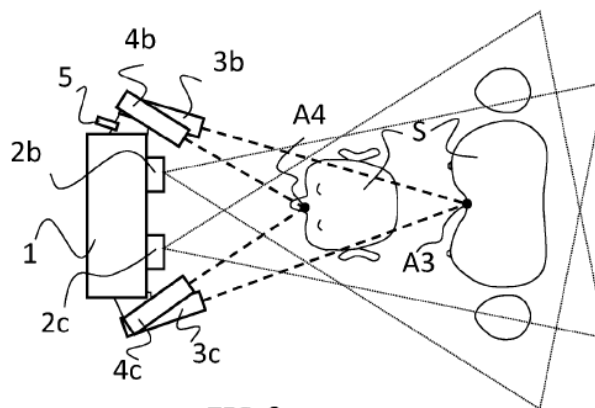


FIG. 2

In Figures 1 and 2, camera body (1) includes double optics (2). *Id.* at 8:43–44. As shown in Figure 2, double optics (2) are “composed of two sub-optics (2b) and (2c), enabling the acquisition of a stereo[-]pair [of images] corresponding to two slightly different viewing angles” simultaneously. *Id.* at 8:45–48; *see id.* at 3:28–31. For example, Figure 8 shown below shows a

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series of stereo-pair images taken at different angles for a face. *Id.* at 11:22–30.

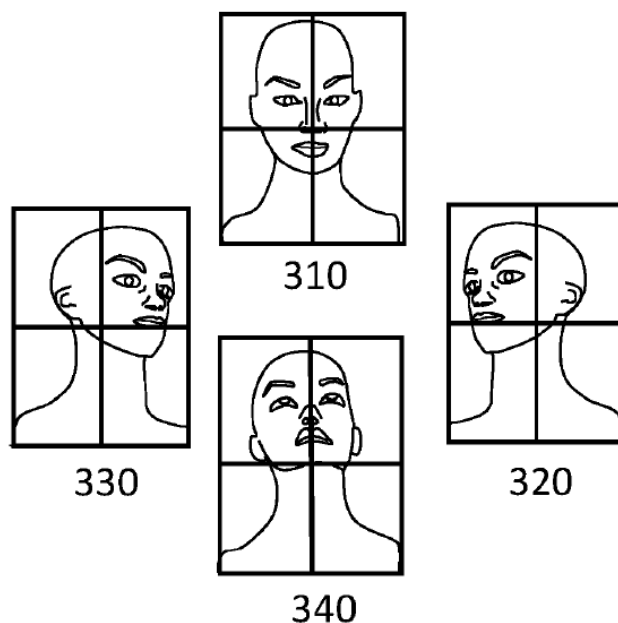


FIG. 8

The '334 patent specification describes Figure 8 as presenting “viewpoints optimized for imaging a face using a field of view close to an A4 surface format.” *Id.* at 4:17–18. Using the captured stereo-pairs, “a comprehensive representation in 3D of the surface of the subject (S)” can be constructed. *Id.* at 10:57–58.

Further, the stereophotogrammetry device captures stereo-pairs of images at “two distinct distances for picture taking corresponding respectively to position (A3) and (A4)” such that the stereo-pairs of images are in focus at positions A3 and A4, which are within the device’s depth of field 6. *Id.* at 8:48–59; *see id.* at 6:41–44. For example, position A3 is used for capturing images of the torso while position A4 is used for capturing images of the face. *Id.* at 6:22–30; *see id.* at 1:60–67. Positions A3 and A4 can be identified by the convergence of respective light patterns projected

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onto the subject to be imaged, the respective light patterns converging at the distances for positions A3 and A4—for example, as shown in Figure 2, a light pattern emitted by first pair of light beamers (3b) and (3c) converge at point (A3) and a different light pattern emitted by second pair of light beamers (4b) and (4c) converge at point (A4). *Id.* at 8:60–64; *see id.* at 4:64–5:3. Accordingly, “by placing the subject so that the light patterns projected by a first pair of beamers are superposed on the surface of the subject[,], one is placing the subject at” the first pre-defined position (and similarly for the light pattern emitted by the second pair of beamers converging at the second position). *Id.* at 4:67–5:2; *see id.* at 5:3–10.

Figure 8 illustrates that for the stereo pairs acquired at distance A4 for the face of subject S, it is advantageous to take a first view 310 from the front of the face, a second view 320 from the side of the face, a third view 330 from the other side and slightly under the face, and a fourth view from the front and slightly under the face. *Id.* at 11:23–20. Figure 9 illustrates a similar approach for acquiring images of a torso at distance A4. *Id.* at 11:31–42.

III. ILLUSTRATIVE CLAIM

Claim 1 is representative of the subject matter claimed in the '334 patent. Claim 1 is reproduced below using paragraph designations from the Petition.

1. [1.01] A device for stereophotogrammetry configured for an acquisition of two views according to two different angles, said acquisition generating a pair of images, with one image corresponding to one of the two views and the other image corresponding to the other of the two views, this pair of images being referred to as a stereo-pair,

[1.02] wherein the device is further comprising a positioning system (34) configured to signal when a target subject (S) is

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reaching one of at least two distinct pre-defined distance positions (A3, A4) relative to the stereophotogrammetry device, the at least two distinct predefined distance positions comprising a closer distance position (A4) and a farther distance position (A3), the closer distance position (A4) corresponding to the target subject (S) being closer to the stereophotogrammetry device and the farther distance position (A3) corresponding to the target subject (S) being farther to the stereophotogrammetry device.

IV. GROUNDS OF INSTITUTION

We instituted trial on the following all ground asserted in the Petition, in particular:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–5, 9–12, 15, 16, 20	103	Plassmann ¹ , Treuillet ² , Staller ³
21–23	103	Plassmann, Treuillet, Staller, Peng ⁴

V. CLAIM CONSTRUCTION

Petitioner submits that no express constructions are required to evaluate the issues raised in the Petition, except for the following terms:

(1) *device for stereophotogrammetry configured for an acquisition of two views according to two different angles* and (2) *a positioning system*

¹ WO 2010/097572 A2, *Method and Apparatus for Stereoscopic Imaging and Adaptor Therefor*, published September 2, 2010 (Ex. 1007).

² S. Treuillet, B. Albouy and Y. Lucas, *Three-Dimensional Assessment of Skin Wounds Using a Standard Digital Camera*, IEEE Transactions on Medical Imaging, vol. 28, no. 5, pp. 752–762, May 2009 (Ex. 1016).

³ U.S. Patent No. 7,257,322, *Photographic Strobe Diffuser*, issued August 14, 2007 (Ex. 1006).

⁴ Qi Peng, Lifen Tu, Kaibing Zhang, Sidong Zhong, *Automated 3D Scenes Reconstruction Using Multiple Stereo Pairs from Portable Four-Camera Photographic Measurement System*, International Journal of Optics Volume 2015 (August 17, 2015) (Ex. 1009).

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configured to signal when a target subject (S) is reaching one of at least two distinct pre-defined distance positions (A3, A4) relative to the stereophotogrammetry device. Pet. 15–20.

A. Positioning system configured to signal when a target subject (S) is reaching one of at least two distinct pre-defined distance positions (A3, A4) relative to the stereophotogrammetry device

In our Decision to Institute, we noted that both parties agree that this term reciting a positioning system should be construed as a means plus function limitation subject to the provisions of 35 U.S.C. § 112(f). Dec. to Inst. 12–13. We adopted Petitioner’s proposal that “[t]he recited function is signaling when a target subject is reaching one of at least two distinct pre-defined distance positions relative to the stereophotogrammetry device” and a person of ordinary skill “would not recognize the phrase to refer to any specific structure.” *Id.* (citing Pet. 19) (alteration in original). Petitioner also states that “[i]f signaling includes the superimposition of two light beams on the subject, then the specification identifies structure including at least two pairs of light beamers for performing that function.” Pet. 19 (citing Ex. 1022, 4:64–5:7). Patent Owner does not dispute Petitioner’s proposed construction, and the proposed construction is consistent with claim language and the ’334 Specification. Thus, we apply this construction for purposes of this Decision.

B. device for stereophotogrammetry configured for an acquisition of two views according to two different angles

1. Introduction

Challenged independent apparatus claim 1 and dependent apparatus claims 2–5 and 9–12 recite a “device for stereophotogrammetry.” Apparatus claim 3 depends from claim 1 and further limits the device to a portable system. Ex. 1022, 12:10–11. No apparatus claim depends directly or

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indirectly from claim 3. Challenged method claims 15–16, 20 recite methods of using the device recited in claim 1 (*see* claim 15), claim 5 (*see* claim 16), and claim 9 (*see* claim 20). Claims 21 and 23 depend from method claim 15. “[T]he presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim.”); *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 910 (Fed. Cir. 2004). Thus, none of the claims, except claim 3, is limited to a device for stereophotogrammetry that is portable.

In the Decision to Institute, we declined to construe this term as a means plus function term under 35 U.S.C § 112(f). Dec. to Inst. 9–12. Although Petitioner disagrees and asserts that the term “device for stereophotogrammetry” should be construed under 35 U.S.C. § 112(f), Petitioner presents no arguments other than those in the Petition that we addressed in the Decision to Institute. Reply 7–8. Petitioner further acknowledges that “an express construction may not be necessary for the Board to evaluate patentability.” *Id.* at 8. For the reasons discussed in the Decision to Institute, we do not construe *device for stereophotogrammetry configured for an acquisition of two views according to two different angles* as a means plus function term under 35 U.S.C. § 112(f).

Our Decision to Institute applied the plain and ordinary meaning to this term without any express construction to the remaining language of this limitation, including “configured for an acquisition of two views according to two different angles.” Dec. to Inst. 9–11. In the context of the challenged claims, the parties dispute the implications of the plain and ordinary meaning.

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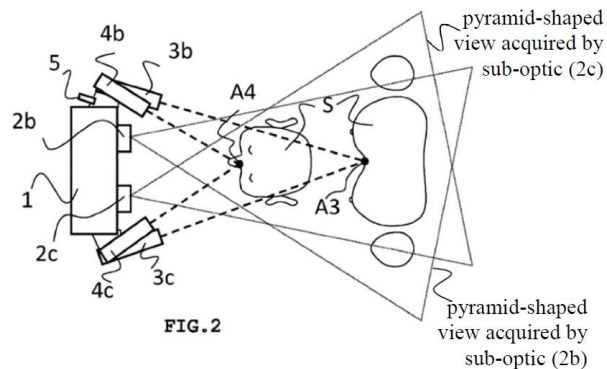
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Patent Owner asserts that “configured for an acquisition of two views” requires acquiring the two views from spaced viewpoints, i.e., that the sub-optics be spaced. PO Resp. 1–6. Patent Owner also argues that we must further construe the term to mean the device must be configured to acquire the two views at two different angles, where “two different angles” means that the views are acquired by sub-optics having a different angle of “optical axis.” *Id.* at 5–25. Noting Patent Owner’s citation of Figure 2 of the ’334 patent as a possible implementation of the device, Petitioner contends that Patent Owner incorrectly asserts the claims require each axis of each of the sub-optics be angled inwards. Reply 1 (citing PO Resp. 6–7; Ex. 1053, Supplemental Declaration of Gerhardt Paul Otto, Ph.D. (“Supp. Otto Decl.”) ¶¶ 9–10). According to Petitioner, the plain language of the limitation “two views according to two different angles” does not recite that the sub-optics are angled, but only that the sub-optics view the subject from different angles. *Id.*

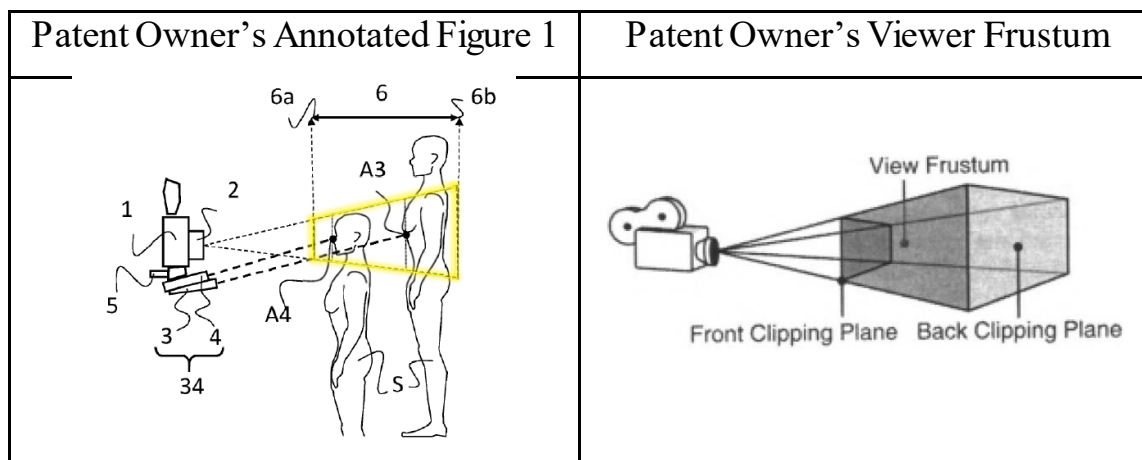
Noting that a viewpoint is the position from which a scene is observed or photographed, Patent Owner argues that the claimed “two views” requires two photographs with the optics so spaced as to acquire two views from different viewpoints. PO Resp. 1 (citing Ex. 2018, Declaration of Dr. Daniel van der Weide (“van der Weide Decl.”) ¶¶ 33–35, 57, 58; Ex. 2019, 188). According to Patent Owner, each view is a pyramid shaped view frustum. *Id.* at 2–4 (citing Ex. 1022, 10:3–14 for the proposition that each view is a “pyramid of the view taking corresponding to sub-optics (2b) or (2c)”); Ex. 2018, van der Weide Decl. ¶¶ 51, 52, 59). Reproduced below is one of Patent Owner’s annotated versions of Figure 2 of the ’334 patent.

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*Id.* at 3.

Below on the left is Patent Owner's annotated version of Figure 1 of the '334 patent; on the right is Patent Owner's illustration of a view/viewing frustum.



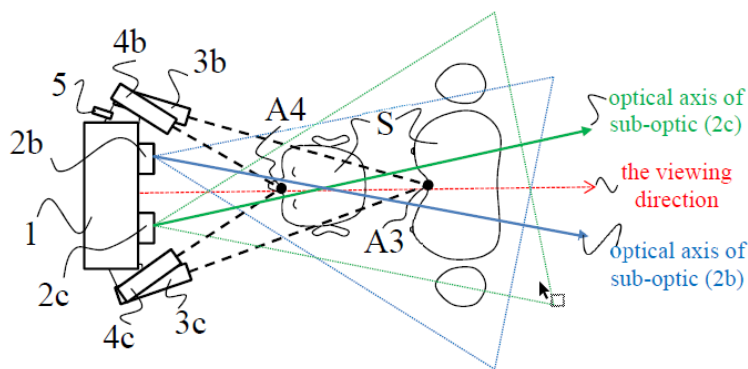
Id. at 3, 4. Patent Owner characterizes the viewing frustum on the right as a flat top pyramid that encompasses the volume of space recorded by a camera having a “front clipping plane” defined by the closest object visible to the camera and a “back clipping plane” defined by the farthest object visible to the camera. *Id.* at 4. Patent Owner identifies the highlighted portion of Figure 1 as the “pyramid of view taking” that defines a frustum shaped volume within which each sub-optic acquires its view. *Id.* at 3. Patent Owner does not identify any discussion in the '334 patent of a pyramid of view taking that “defines a frustum shaped volume.” According to Patent

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Owner, an ordinarily skilled artisan would understand that Figure 1 is a side view of the intersecting flat-top pyramids that encompass the volume of space recorded by double optics 2, where 6A is the front clipping plane (the plane closest to the stereophotogrammetry device and for which the images start to be focused) and 6B is the back clipping plane (the plane farthest from the stereophotogrammetry device and for which the images are no more in focus). *Id.* at 4–5 (citing Ex. 1022, 8:55–59; Ex. 2018, van der Weide Decl. ¶¶ 62–63); Dr. van der Weide also states that three dimensional reconstruction of a subject can be obtained only where the two pyramid-shaped view frustums intersect (stating that in Figure 1 the field of view of closer point position A4 is defined by the intersection of the pyramid of the view taking corresponding to sub-optics (2b) or (2c) with the plane perpendicular to the viewing direction and including point A4, and the field of view of at the farther point position A3 is defined by the intersection of the pyramid of the view taking corresponding to sub-optics (2b) or (2c) with the plane perpendicular to the viewing direction and including point A3). *See* Ex. 2018, van der Weide Decl. ¶ 78–79.

Reproduced below is another annotated version of Figure 2 of the '334 patent provided by Patent Owner.



PO Resp. 18. Figure 2 represents a “possible implementation” of the '334 patent’s device viewed from the top. Ex. 1022, 4:1–2. Patent Owner

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annotates Figure 2 by coloring the light pyramid extending from sub-optic 2b in blue and coloring the light pyramid extending from sub-optic 2c in green. PO Resp. 17–18 (citing Ex. 2018, van der Weide Decl. ¶ 93). Patent Owner also adds a solid blue line and solid green line at the center of each sub-optic to illustrate the “optical axis” of the sub-optic. *Id.* Patent Owner does not identify any corresponding discussion in the Specification.

Petitioner contends that the claim language does not require that the sub-optics be angled, but instead only requires that the sub-optics “view” the subject from different angles. Reply 1–7. Patent Owner contends that the claim language does not mention light from the subject object be imaged, or the angles at which light is received from different points on the object. PO Resp. 19. According to Patent Owner, “[r]ather the ‘two different angles’ limitation defines an intrinsic feature of the device, i.e. how it is configured.” *Id.* (citing Ex. 2018, van der Weide Decl. ¶ 100).

Having considered the claim language, the specification, the prosecution history, and the extrinsic evidence, for the reasons discussed below, we conclude that the claim language does not mean that the sub-optics are angled, but instead means that they each view a subject from different angles.

2. *Analysis*

a) *The claim language*

The relevant language of claim 1 recites “[a] device for stereophotogrammetry configured for an *acquisition of two views according to two different angles.*” Ex. 1022, claim 1 (emphasis added). The recitation “according to two different angles” immediately following the recitation “acquisition of two views” suggests that the recited “two different angles” concerns the views themselves. Recognizing that claim 1 recites the device

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is “configured to” acquire these views, however, we further analyze the claim language. *See* PO Resp. 1, 19 (“the ‘two different angles’ limitation defines an intrinsic characteristic of the device, i.e., how it is ‘configured.’”).

We understand the parties to argue that, based on plain language, the claimed two sub-optics must be configured (i.e., physically orientated) in a manner that makes them capable of acquiring “two views according to two different angles.” As discussed further herein, Petitioner’s arguments emphasize whether the view of the subject is from two different angles; Patent Owner’s arguments emphasize whether the optical axes of the sub-optics are at two different angles. Petitioner points out that “PO asserts the challenged claims require the axis of each set of sub-optics to be angled inwards.” Reply 1. Patent Owner argues “[a] POSITA would understand that each (i) ‘optical path’ in Fig. 6 extends along the optical axis of the sub-optic, and (ii) optical axis is located at the center of the view frustum acquired by the sub-optic and is the axis of the view.” PO Resp. 16–17 (citing Ex. 2018, van der Weide Decl. ¶¶ 89, 94–96).

Patent Owner contends “the ‘subject’ is claimed only in connection with the ‘positioning system (34)’ ‘configured to signal when a target subject (S) is reaching[.] . . . pre-defined distance positions (A3, A4) of the target subject (S) relative to the camera body (1).” *Id.* at 19. This claim language limits the device to one that “is further comprising” a positioning system “configured to signal when a target subject (S) is reaching one of two pre-defined distance positions (A3, A4) relative to the photogrammetry device.” Ex. 1022, 11:60–63.

Patent Owner’s argument that this language further limits the axes of the sub-optics is unavailing. As discussed above, Patent Owner contends that “configured for an acquisition of two views” requires acquiring the

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views from spaced viewpoints. PO Resp. 1. Patent Owner’s discussion of the frustum or the pyramid of the view taking in Figure 2 of the ’334 patent does not address the broad claim language reciting that the acquisition generates a pair of images, one for each of the two views. Ex. 1022, 11:54–59 (claim 1), *see* Section V.A.1 herein. The claim language merely requires two views—it does not require that the two views be taken by sub-optics with optical axes that are not parallel or point inward. The claimed “views” refer to viewed subject material (e.g., a desired target subject or merely whatever exists at the viewing plane).

For similar reasons, we also find unavailing Patent Owner’s argument that the claims “disclose configuring the sub-optics according to ‘two different angles’ as a prerequisite to ‘pre-defining’ the ‘positions (A3, A4) of the target subject (S),’ as further claimed, and locating the subject at such positions within the two views.” PO Resp. 19–20 (citing Ex. 2018, van der Weide Decl. ¶ 103); *see also id.* at 20 (arguing that dependent claims drawn to locating a target subject at the predefined distance before taking stereo-pairs at the same predefined distance position also supports this argument). We likewise find unavailing Patent Owner’s argument that “the ‘two different angles’ limitation has nothing to do with the angles at which the sub-optics receive light from a subject, but rather defines the space within which the subject must be located to be imaged in the first place.” *Id.* at 20 (citing Ex. 2018, van der Weide Decl. ¶ 100); Sur-reply 2. These arguments are inapposite, and do not preclude the claimed sub-optics from being parallel, as Patent Owner argues. Rather, Patent Owner acknowledges, conventional stereophotogrammetry devices can include parallel sub-optics “configured (spaced) to acquire two views,” and provide a stereoscopic binocular area where “the parallel views intersect to form

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stereo-pairs that can be reconstructed into three-dimensional representations.” PO Resp. 5–6; Ex. 2018, van der Weide Decl. ¶ 67; Ex. 2020,⁵ 90. Hence, the target subject S can be located at distances within that stereoscopic binocular area, which is consistent with Patent Owner’s argument that the limitation “defines the space within which the subject must be located to be imaged in the first place.” Ex. 2020, 90; PO Resp. 6, 20–21.

According to Patent Owner, Petitioner’s argument that images acquired by mirrors spaced apart acquires two views “necessarily taken at different angles” improperly reads the “two different angles” limitation out of claim 1. PO Resp. 7–8 (citing Pet. 32 (Petitioner’s discussion of Plassmann)), 22 (arguing that “[s]uch a construction is inconsistent with the plain language of the claims and written description and would render the limitation meaningless.”); Sur-reply 5–6. Patent Owner further argues that Petitioner “reads ‘the subject’ [of the stereophotogrammetry] into the claim to argue that ‘two different angles’ refers to ‘the different angles from each of the sub-optics to the subject.’” Sur-reply 5. Claim 1 explicitly recites “said acquisition generating a pair of images with one image corresponding to one of the two views and the other image corresponding to the other of the two views.” Ex. 1022, 11:56–58 (claim 1). As discussed above, we agree with Petitioner and conclude that acquiring views “according to two different angles” relates to acquiring images of a subject. We also agree with Petitioner and conclude that claim 1 does not otherwise limit how the two sub-optics are displaced, e.g., to exclude a conventional stereophotogrammetry device, that can acquire views of a subject from

⁵ Richard W. Kroon, *3D A-to-Z, An Encyclopedic Dictionary* (2012).

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different angles. *Id.* at 11:43–58; Reply 7 (citing Ex. 1053, Supp. Otto Decl. ¶ 31 (“[t]he claim does not recite ‘displacing the sub-optics’ other than by means of its reference to acquiring views ‘according to two different angles’”).

We also agree with Petitioner that “the preamble here is not limiting, because the body of the claim provides a complete description of the device.” Reply 6–7 (citing *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997)). The preamble for claim 1 recites “[a] device for stereophotogrammetry,” but “[g]enerally, the preamble does not limit the claims.” Ex. 1022, 11:42; *Georgetown Rail Equip. Co. v. Holland L.P.*, 867 F.3d 1229, 1236 (Fed. Cir. 2017). Regardless, as Petitioner notes, no “canon of claim construction is absolute in its application and [] some surplusage may exist in some claims.” Reply 7 (alteration in original) (quoting *Decisioning.com, Inc. v. Federated Dep’t Stores, Inc.*, 527 F.3d 1300, 1312 n.6 (Fed. Cir. 2008) (acknowledging that proper construction of “remote interface” arguably “render[s] the term ‘public’ in [a dependent claim] surplusage”)).

b) The Specification

Figures 2 through 5 of the ’334 patent illustrate pyramid-shaped views acquired by the sub-optics where the pyramids are inwardly angled (rather than being perpendicular to the device’s plane). Ex. 1022, Figs. 2–5, 10:3–15 (discussing the pyramid of the view taking corresponding to sub-optics (2b) or (2c) with the plane perpendicular to viewing directions including close distance point A4 and farthest distant point A3). The Specification indicates that all of these figures illustrate *possible* or *exemplary* implementations. *See, e.g., id.* at 3:59–4:5 (stating that Figures 1, 2 and 3 each illustrate a “possible implementation”), 9:47–48 (stating that Figure 4 is

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an “exemplary device”), 9:55–56 (stating that Figure 5 is an “exemplary device”). Nevertheless, the claims do not limit the optical axes of the pyramids and the Specification does not discuss the optical axes of the pyramids as essential features of the claimed invention. To the contrary, the Specification provides that “[t]he double optics of the stereophotogrammetry device can be manufactured in different ways without impacting the functionality of the invention, provided that it is characterized by an increased depth of field.” *Id.* at 4:38–41.

Dr. Otto notes that the written description does not discuss optical axes or the frustums referenced by Dr. van der Weide. Ex. 1053, Supp. Otto Decl. ¶ 27. Rather than identify converging inwardly angled optical axes, the Specification repeatedly refers to different angles of the sub-optics relative to the viewed subject in a manner similar to the claims. *See, e.g.*, Ex. 1022, 4:28–30 (referring to “double optics enabling the acquisition of two simultaneous views with different angles of the subject”), 4:44–46 (referring to “double optics” using “secondary mirrors each receiving one image of the subject with a slightly different angle”). The Specification also acknowledges that “angle” could refer to “viewing angle,” thus suggesting that angle may merely refer to a different view. *Id.* at 3:47–49 (referring to “double optics enabling to simultaneously acquire at least two pictures according to two different viewing angles”), 8:44–47 (referring to “double-optics” with “two sub-optics (2*b*) and (2*c*), enabling the acquisition of a stereo pair corresponding to two slightly different viewing angles”).

The written description also refers to a series of stereo-pairs taken such that the “angle of the views are close the these [sic] presented in FIG. 9.” *Id.* at 11:33–34. We reproduce Figure 9 of the ’334 patent below.

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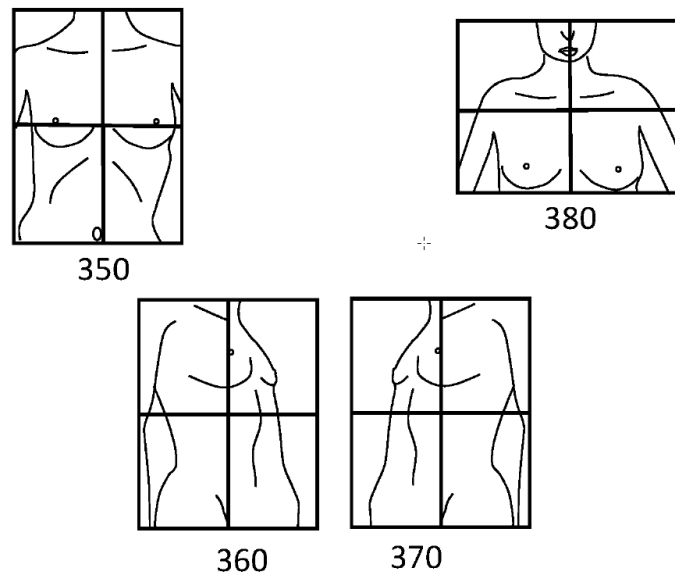
**FIG. 9**

Figure 9 “present[s] viewpoints optimized for imaging a torso using a field of view close to an A3 surface format.” *Id.* at 4:19–20. The “angle of the views,” in this context, refers to the angle the stereo-pairs are taken relative to the position of the subject. *Id.* at 11:30–42. Although the stereophotogrammetry device is moved between acquisition of each stereo-pair, the term “angle” in this context does not reference an optical axis, but rather is relative to the position of the subject. As the ’334 written description does not address an optical axis or define an angle of the sub-optics, it does not serve to limit or particularly define claim scope with regard to the optical axis.

We find unavailing Patent Owner’s arguments concerning problems described in the Background section of the Specification and the advantages of the ’334 patent. PO Resp. 9–15. For example, the ’334 patent discloses that portable stereophotogrammetry devices previously developed included “a single, nominal distance for picture taking which is optimized either for the face or for breast, but not optimized for both applications at the same

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time,” according to Patent Owner. *Id.* at 8–9 (quoting Ex. 1022, 3:16–20; citing Ex. 2018, van der Weide Decl. ¶ 73). Patent Owner argues that the ’334 patent “ties the ‘two different angles’ limitation to overcoming the problem in the prior art and achieving the advantage of the invention” (i.e., a single stereophotogrammetry device for both distances). *Id.* at 9–10 (citing Ex. 1022, 3:56–61); *see also id.* at 10 (citing Ex. 1022, 4:43–46, 8:44–47; Ex. 2018, van der Weide Decl. ¶ 76) (making same argument).

According to Patent Owner, however, if the sub-optics are configured for parallel views, the field of view at point (A4) in Figure 2 “is too small to image the face and would not achieve the ‘advantage of the invention,’ *i.e.*, ‘a single portable stereophotogrammetry system . . . enabling the 3D reconstruction of the head . . . and . . . torso.’” *Id.* at 15 (quoting Ex. 1022, 8:28–35; citing Ex. 2018, van der Weide Decl. ¶¶ 56, 87) (alterations in original). This argument is unavailing. We agree with Petitioner that “[s]imply moving the subject further from the camera would place the face” within the view pyramids. *See* Reply 3–4; Ex. 1053, Supp. Otto Decl. ¶ 24. As can be seen for the version of Figure 2 modified by Patent Owner to show parallel view pyramids, a sufficient field of view for the face and torso is within the binocular area if the subject is moved further from the camera. *See* PO Resp. 14 (modifying Ex. 1022, Fig. 2); *see also* Ex. 1053, Supp. Otto Decl. ¶ 29 (testifying that moving further away “[i]f no other changes were made, . . . would slightly lower the 3D resolution of the surface captured by the device compared to using angled frustums,” “[h]owever, in this application area a slight decrease in resolution is acceptable”).

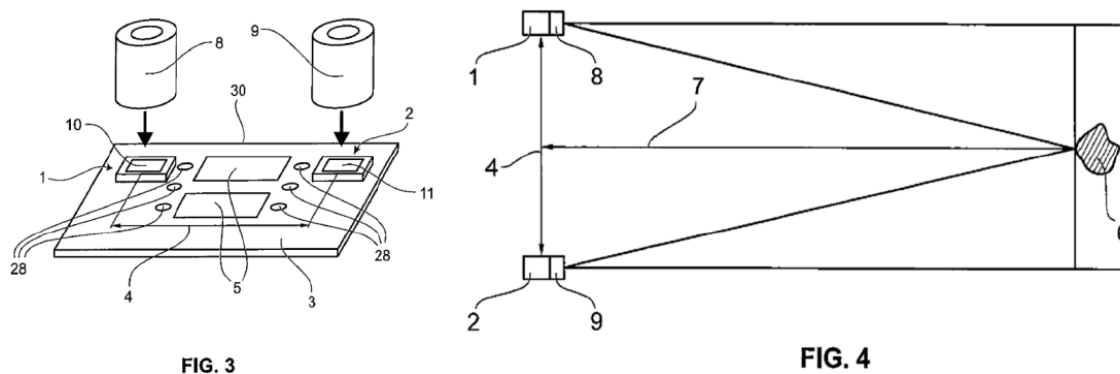
In sum, we find that the ’334 Specification does not address optical axes, and does not serve to limit the plain and ordinary meaning of this limitation so as to exclude parallel sub-optics.

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c) The prosecution history

We next turn to the patent prosecution history. The '334 patent is a continuation of U.S. Patent No. 10,070,119 B2 (“the ’119 patent”). *See* Ex. 1022, code (63). Prosecution history “can often inform the meaning of the claim language by demonstrating how the inventor understood the invention.” *Phillips*, 415 F.3d at 1317. The prosecution history of the ’119 patent is relevant to the claim construction issues before us. *See* Ex. 1002.

In particular, Patent Owner treated the “according to two different angles” language differently during prosecution of the ’119 patent than it does now. During prosecution, the Examiner rejected the challenged claims over Hoffmeier⁶ and concluded that Hoffmeier disclosed a stereophotogrammetry device comprising “two sub-optics (2b) and (2c) configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1002, 63–66; Ex. 1053, Supp. Otto Decl. ¶ 12. Figures 3 and 4 of Hoffmeier are reproduced below side by side (Figure 3 is on the left and Figure 4 is on the right).



Ex. 1005, Figs. 3, 4. Hoffmeier Figure 3 depicts the Hoffmeier device.

Ex. 1053, Supp. Otto Decl. ¶ 13. Hoffmeier Figure 3 is a perspective view

⁶ US 2011/0175987 A1, *Stereo Camera System*, published July 21, 2011 (Ex. 1005)

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of the Hoffmeier system. Ex. 1005 ¶ 25. Hoffmeier Figure 4 “shows the schematic structure of a stereo camera system according to Figs. 1 to 3” with image detection sensors 1, 2 arranged at a defined distance from each other and optical systems 8, 9 at a distance 7 from object 6 in front of the stereo camera system. *Id.* ¶ 37. Thus, Hoffmeier Figure 4 shows components 8, 9 each consisting of one or more lenses and/or further optical elements. Ex. 1053, Supp. Otto Decl. ¶ 14.

Hoffmeier describes lenses that face forward rather than at an angle. Ex. 1005, Figs. 3, 4, ¶ 35 (“The two optical systems 8, 9 can be coupled to the board 3 such that the respective optical axis of an optical system 8, 9 runs through the center point of the image sensing area 10, 11 of an image detection sensor 1, 2”); *see also* Ex. 1053, Supp. Otto Decl. ¶ 14 (Petitioner’s witness, Dr. Otto, opining that Hoffmeier Figure 4 “shows components 8 and 9 as having parallel axes”).

During prosecution Patent Owner submitted a statement of CEO and ’334 named patent inventor, Dr. Jean-Philippe Thirion, responding to the Examiner’s rejection over Hoffmeier. *See* Ex. 1002, 88. In that submission, Patent Owner acknowledged that Hoffmeier teaches claim 1’s “two different angles” recitation as follows:

Being devoid of any positioning system external to the stereovision system itself makes Hoffmeier quite different from the invention described in ’981 [(referencing the ’981 application that led to the ’119 patent)]. Hoffmeier therefore discloses “A device for stereophotogrammetry comprising a camera body (1) and a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views **according to two different angles**” as in claim 1 of ’981, but it is all that Hoffmeier discloses relative to claim 1 of ’981.

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Ex. 1002, 92 (*italic emphasis omitted, bold emphasis added*). Patent Owner further admitted that “8 and 9 in FIG 3 of Hoffmeier exactly correspond to 2b and 2c i[n] FIG. 2 of [the ’334 patent].” *Id.* at 91–92.

Patent Owner’s admissions during prosecution indicates to the public that Patent Owner understood that spaced optics with parallel optical axes may, nonetheless, fall within the scope of claim 1 of the ’334 patent. Patent Owner now downplays these admissions by arguing that Hoffmeier “is ambiguous as to whether the optical axes of 8, 9 are angled inwards, or are parallel.” Sur-reply 7. Patent Owner’s ambiguity arguments are unavailing. Patent Owner cannot now assert that “the plain and ordinary meaning discerned from the claims and specification” (*id.*) is different from the meaning Patent Owner acknowledged during prosecution of the ’119 patent. Even if the term were ambiguous, Patent Owner admitted in the prosecution record that, for purposes of claim construction, Hoffmeier taught the claimed limitation “two views according to two different angles.” Ex. 1002, 92. The prosecution history, thus, suggests that Hoffmeier’s optical axes orientation is not important to whether the “two different angles” recitation is met. As such, Patent Owner’s prosecution history statement aligns with the present arguments of Petitioner, not Patent Owner.

d) Extrinsic evidence

Although less critical than the prosecution history, extrinsic evidence⁷ also supports Petitioner’s claim construction position. During district court litigation involving the ’119 patent, Patent Owner responded to Petitioner’s

⁷ Patent Owner also argues that a technical dictionary supports that views are pyramid-shaped frustums with an optical axis. PO Resp. 4–6, 16–17. We address Patent Owner’s discussion of this subject matter in the Introduction above. *See* Section V.B.1 herein.

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invalidity allegations regarding the Plassmann reference by agreeing that Plassmann teaches the now disputed “according to two different angles” language, stating QuantifiCare agrees that the quoted language and figure include, *inter alia*, a double-optics comprising two sub-optics configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1037, 2; *see also* Reply 5–6. Patent Owner now disputes that Plassmann teaches this recitation. *See, e.g.*, PO Resp. 27 (arguing that “[Petitioner’s] contention that Plassmann acquires ‘two views according to two different angles’ is incorrect”) (emphasis omitted). Thus, Patent Owner’s position in the District Court litigation was consistent with its position during prosecution, but inconsistent with its position in the current proceeding.⁸ This inconsistency at least somewhat weighs against Patent Owner’s claim construction arguments.

e) Claim construction conclusion

Having considered the evidence of record, including the language of the claims, the specification, the prosecution history, and the extrinsic evidence, as well as the argument put forth by the parties, we find that the preponderance of the evidence supports a construction that claim 1’s “two views according to two different angles” language does not require that the optical axis of each sub-optic be angled, but instead requires only that the sub-optics view the subject from different angles.

⁸ Patent Owner argues that this extrinsic evidence should be disregarded. Sur-reply 8–9. We disagree. While the extrinsic evidence is entitled to less weight, it nonetheless bolsters the intrinsic evidence establishing that Patent Owner—outside of the instant proceeding—understood “two views according to two different angles” in accordance with Petitioner’s claim construction.

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VI. ANALYSIS OF PRIOR ART CHALLENGES

A. Introduction

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Additionally, the obviousness inquiry typically requires an analysis of “whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”)); *see In re Warsaw Orthopedic, Inc.*, 832 F.3d 1327, 1333 (Fed. Cir. 2016) (citing *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d 1356, 1360 (Fed. Cir. 2006)).

An obviousness analysis “need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court

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can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR*, 550 U.S. at 418; *accord In re Translogic Tech., Inc.*, 504 F.3d 1249, 1259 (Fed. Cir. 2007). Petitioner cannot satisfy its burden of proving obviousness by employing “mere conclusory statements.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016). Instead, Petitioner must articulate a reason why a person of ordinary skill in the art would have combined the prior art references. *In re NuVasive*, 842 F.3d 1376, 1382 (Fed. Cir. 2016).

A reason to combine or modify the prior art may be found explicitly or implicitly in market forces; design incentives; the “interrelated teachings of multiple patents”; “any need or problem known in the field of endeavor at the time of invention and addressed by the patent”; and the background knowledge, creativity, and common sense of the person of ordinary skill. *Perfect Web Techs., Inc. v. InfoUSA, Inc.*, 587 F.3d 1324, 1328–29 (Fed. Cir. 2009) (quoting *KSR*, 550 U.S. at 418–21).

As part of determining whether a claim is obvious in light of the prior art, we consider any relevant evidence of secondary considerations of non-obviousness. *See Graham*, 383 U.S. at 17. Notwithstanding what the teachings of the prior art would have suggested to one of ordinary skill in the art at the time of the invention, the totality of the evidence submitted, including objective evidence of non-obviousness, may lead to a conclusion that the challenged claims would not have been obvious to one of ordinary skill. *In re Piasecki*, 745 F.2d 1468, 1471–72 (Fed. Cir. 1984). Petitioner argues there are no secondary considerations applicable in this proceeding.

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Pet. 74–76.⁹ Patent Owner contends that secondary considerations demonstrate the claims recite patentable subject matter. PO Resp. 57–67; Sur-reply 25–30.

We analyze the asserted grounds of unpatentability in accordance with these principles to determine whether Petitioner has met its burden to establish by a preponderance of the evidence that the claims are unpatentable.

B. Plassmann

Plassmann is a World Intellectual Property Organization publication that relates to an apparatus for the production of stereoscopic images. Ex. 1007, codes (10), (19), (57). Plassmann describes variations of the “MAVIS” system. *Id.* at 11:25–12:29. Plassmann’s apparatus captures “two images [which are] needed to form a stereo image . . . to produce a three-dimensional representation of the subject.” *Id.* at 12:25–29. The apparatus further includes two light emitting diodes (LEDs) emitting respective beams which converge at a particular distance in front of the apparatus. *Id.* at 12:7–13.

Below, we reproduce Plassmann Figures 1A and 1B.

⁹ The last correctly numbered page of the Petition is page 73. The Petition incorrectly numbers subsequent pages, with page 74 unnumbered and pages 75–76 numbered pages 2 and 3.

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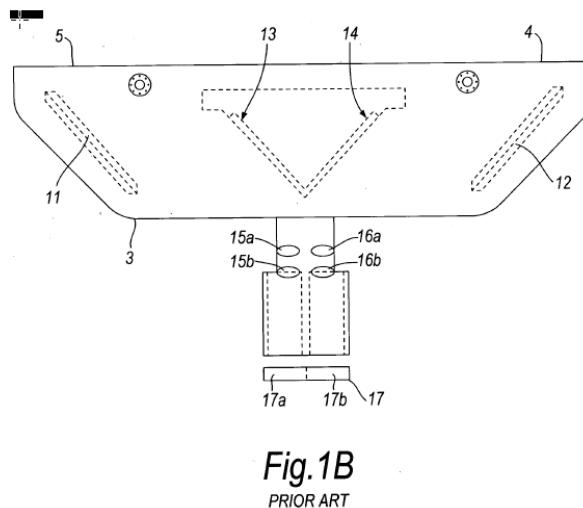
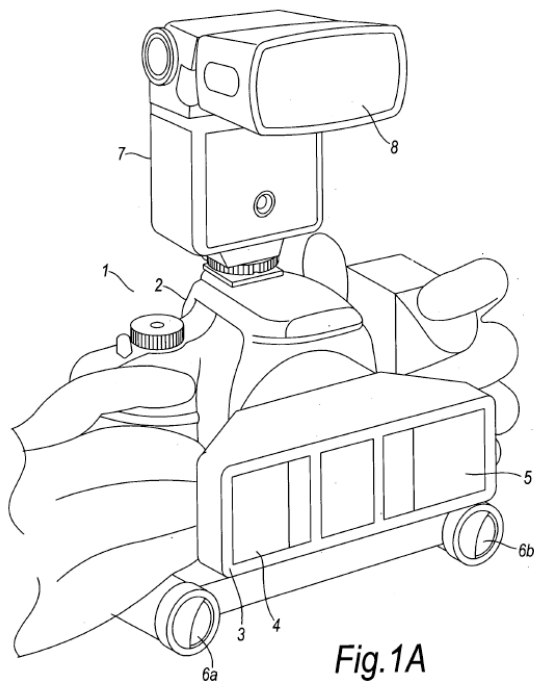


Figure 1A is a perspective representation of an apparatus for obtaining stereoscopic images, showing body 2, e.g., a camera, and adaptor 3. *Id.* at 11:3–4, 11:28–12:4. Further Figure 1B shows a “plan view” of adaptor 3 in further detail. *Id.* at 11:5–6, 12:13–14. Adaptor 3 has two apertures 4, 5 which respectively collect light that is respectively focused onto charge coupled device parts 17a, 17b, forming respective first and second images. *Id.* at 12:15–25. The first and second images form a stereo image used to produce a three-dimensional representation of a subject. *Id.* at 12:25–29. As shown in Figure 1A, Plassmann’s apparatus includes two low-powered light emitting diodes (LEDs) 6a, 6b, each provided with a [focusing] lens to produce a beam of light and being arranged so that the beams converge and meet at a point a fixed and desired distance from the apparatus, this distance corresponding to the distance at which the camera lens is [focused]. *Id.* at 12:8–13. The converging beams act as “a guide to show distance between the apparatus and subject.” *Id.* at 16:12–14.

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C. Trueillet

Treuillet is a paper that relates to an “approach to build 3-D models of skin wounds from color images.” Ex. 1016, 752. Treuillet explains that “[b]y taking two color images from different points of view, stereophotogrammetry allows the computation of the 3-D coordinates of numerous points on the skin lesion.” *Id.* at 754.

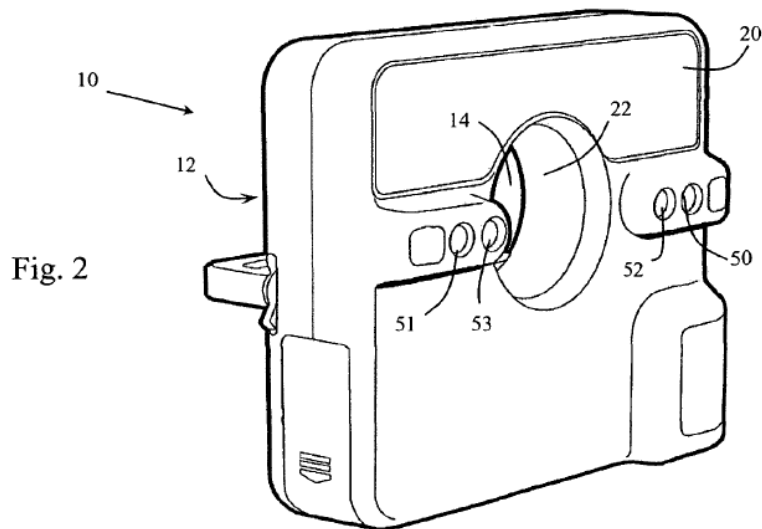
By way of imaging technology background, Treuillet describes the MAVIS II system as “a reflex digital camera equipped with special dual lens optics for recording two images from slightly different viewpoints, generating a stereo pair” which includes “two tube-shaped projectors produce beams of light which intersect in a single spot when the camera is held at the right distance” at “about 80 cm from the wound,” with a tolerance of plus or minus 15 cm. *Id.* at 755.

D. Staller

Staller is a U.S. patent that relates to a diffuser attachment for a camera including a “distance measurement device [that] uses a pair of light beams which intersect at a repeatable distance from the diffuser body to readily enable positioning of an object to be photographed at that repeatable distance.” Ex. 1006, codes (10), (12), (57).

Below, we reproduce Figure 2, which shows a front perspective view of a diffuser. *Id.* at 3:13–14.

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As shown in Figure 2, the diffuser “includes a distance measurement device or indicator in the form of a plurality of light beam emitters 50–53.” *Id.* at 5:13–15. “Each pair of emitters 50–51, 52–53 creates a pair of angled light beams which intersect at different distances in front of diffuser body 12.” *Id.* at 5:17–19. As such, “[e]ach of the pairs of light beams allows diffuser 10 to be relocated at the same repeatable distance from a subject.” *Id.* at 5:19–21; *see id.* Fig. 4. That is, each pair of emitters indicates a different distance. *Id.* at 2:30–35; *see id.* at 5:64–6:2.

Further, either of the emitter pairs, i.e., pair 50–51 or pair 52–53, are selected using a selector switch. *Id.* at 5:38–41. By selecting a particular emitter pair, the distance measurement device indicates a particular distance measurement. *See id.*

E. Peng

Peng is a paper that relates to an “automatic 3D reconstruction method” to reconstruct a 3D scene using “complementary stereo information from four cameras.” Ex. 1009, 1. In particular, Peng’s “3D model reconstruction system us[es] images acquired from multiple stereo pairs.” *Id.* at 2. Peng explains that a “normal camera” has a “limited field-of-view.”

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Id. at 6. Accordingly, Peng describes a process to “reconstruct a large and integrated scene” by “finding more than three spatial matched points between different 3D models [and] can achieve 3D model stitching.” *Id.*; *see id.* at 2–3.

F. Claims 1–5, 9–12, 15–16, and 20–23 As Obvious over Plassmann, Treuillet, and Staller

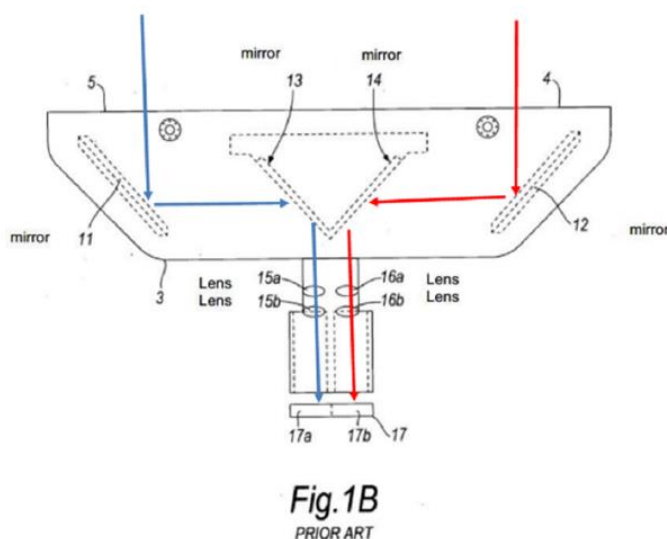
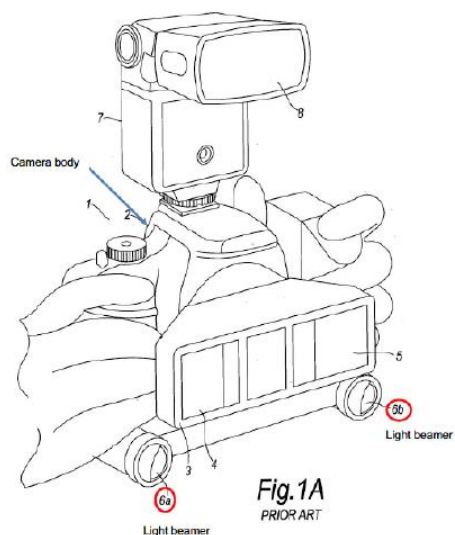
1. Claim 1

a) Claim Limitation 1.01

Claim limitation 1.01 recites

[a] device for stereophotogrammetry configured for an acquisition of two views according to two different angles, said acquisition generating a pair of images, with one image corresponding to one of the two views and the other image corresponding to the other of the two views, this pair of images being referred to as a stereo-pair.

Figures 1A and 1B of Plassmann, as annotated by Petitioner are reproduced below.



Pet. 32 (citing Ex. 1007, Figs. 1A, 1B). Plassmann identifies Figure 1A as showing a known apparatus for obtaining stereoscopic images and Figure 1B

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as showing a known adaptor used in the apparatus of Figure 1A. Ex. 1007, 12:3–6. Petitioner cites Plassmann as disclosing a device for stereophotogrammetry including adapter 3 attached to camera body 2 to capture stereo images along paths labelled in red and blue. Pet. 31. Petitioner states that Plassmann’s adaptor 3 “acquires two views of an object from two different angles via mirrors 11 and 12, to reconstruct a 3-D representation of imaged objects.” *Id.* at 32 (citing Ex. 1007, 12:25–29, stating, “[t]he first and second images are the two images needed to form a stereoimage and data from the two images may be analyzed using suitable software to produce a three-dimensional representation of the subject.”).

Patent Owner contends that Petitioner fails to establish that Plassmann’s sub-optics are configured to acquire their views according to two different angles, as claimed. PO Resp. 26–31. Citing Petitioner’s annotated versions of Plassmann, Patent Owner contends that Petitioner acknowledges Plassmann teaches views that are along parallel optical axes and not on optical axes that are at two different angles. *Id.* (citing Pet. 22–23, 31–32); *see id.* at 30 (stating “[t]he Petition does not contend that Plassmann’s optical axes or view frustums are not parallel.”). Noting Petitioner’s assertion that in Plassmann mirrors 11 and 12 acquire two different views of an object from two different angles, Patent Owner repeats its contention that the spacing of the mirrors means only that each mirror acquires a different view, not that the views are acquired at different angles, a contention that we found unpersuasive in our claim construction analysis. *Id.* at 30–31; *see* Section V herein.

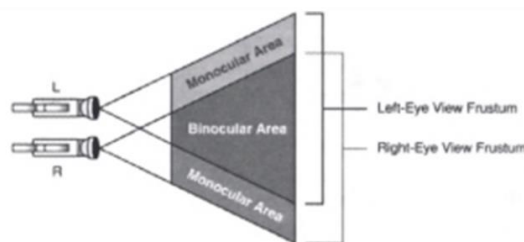
According to Patent Owner “[t]his parallelism of the optical axes means the angles of the views of the sub-optics are the same, not different.” *Id.* at 30. As we discuss extensively in Section V herein, we decline to adopt

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a claim construction of the two views that requires the optical axes of the sub-optics be at different angles, as Patent Owner advocates. Instead we construe claim 1's "two views according to two different angles" language to not require that the optical axis of each sub-optic be angled, but instead to only require that the sub-optics view the subject from different angles.

Reproduced below is Patent Owner's illustration of a conventional stereophotogrammetry device configured to acquire two views that Patent Owner characterizes as being at the same angle.



Id. at 5 (citing Ex. 2020, 90; Ex. 2018, van der Weide Decl. ¶ 67).

According to Patent Owner, the L and R camera are configured, i.e., spaced, to acquire two views, but because the "Left Eye View Frustum" and the "Right Eye View Frustum" are parallel, the two views are parallel and acquired at the same angle. *Id.* Patent Owner's acknowledgment of this arrangement as conventional is important, as the claim as construed above encompasses this arrangement.

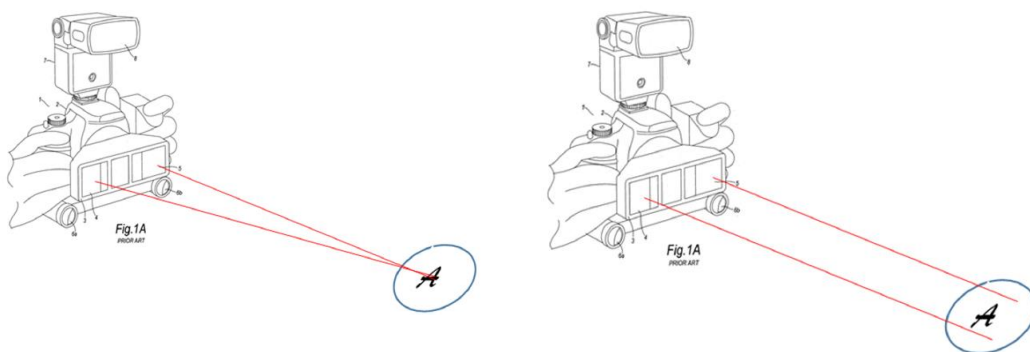
Petitioner further argues that even if we construed the "two views according to two different angles" limitation to exclude parallel sub-optics, as Patent Owner suggests, Plassmann discloses the limitation because Plassmann's example image (a stylized letter A recessed into the surface of a pot of hand cream) can appear in the same position in left and right hand images only if both sub-optics were angled inward. Reply 10–11; Ex. 1007, 12–13. Patent Owner contends we should ignore this argument because

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Petitioner manipulated the width-to-height ratio when creating the illustration discussed at page 11 of the Reply. Sur-reply 11–12. Even if the scale in Petitioner’s illustration is incorrect, the point of Petitioner’s illustration does not concern the size and height of the image, but instead, demonstrates that the image of the stylized A appears in the center of the circle representing the pot of cream (as in Plassmann, Fig. 3A) when Plassmann’s sub-optics is angled inward and appears shifted in each of the left hand and right hand images if the sub-optics is parallel. *See* Ex. 1053 Supp. Otto Decl. ¶¶ 42–48. Dr. Otto notes that Petitioner’s position is consistent with the position asserted by Dr. van der Weide, i.e., that parallel sub-optics would produce images in which the object is markedly shifted in each image. *Id.* ¶ 36 (citing Ex. 2018, van der Weide Decl. ¶ 68). Patent Owner contends that Petitioner’s argument that Plassmann’s sub-optics is angled inwards fails because Fig 3A of Plassmann illustrates the images actually are shifted. Sur-reply 12–16.

Petitioner further supports its analysis with the following annotated versions of Figure 1A of Plassmann, shown side by side.



PO Resp. 10–11. Petitioner states that its annotated figure on the left is indicative of Plassmann’s sub-optics angled inward and the annotated figure

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on the left is indicative of a parallel sub-optics. *Id.*; *see also* Ex. 2044, 4¹⁰ (showing target beams of MAVIS II merging when camera located 80 cm from target).

For purposes of claim 1, we need not determine whether Plassmann discloses inwardly angled sub-optics, as we construed “two views according to two different angles” language to not require that the optical axis of each sub-optic be angled, but instead to require only that the sub-optics view the subject from different angles. Accordingly, we find that Petitioner has demonstrated that Plassmann would have disclosed claim limitation 1.01 to a person of ordinary skill in the art.

b) Claim Limitation 1.02

Claim limitation 1.02 recites

wherein the device is further comprising a positioning system (34) configured to signal when a target subject (S) is reaching one of at least two distinct pre-defined distance positions (A3, A4) relative to the stereophotogrammetry device, the at least two distinct predefined distance positions comprising a closer distance position (A4) and a farther distance position (A3), the closer distance position (A4) corresponding to the target subject (S) being closer to the stereophotogrammetry device and the farther distance position (A3) corresponding to the target subject (S) being farther to the stereophotogrammetry device.”

Petitioner asserts that the combined teachings of Plassmann, Treuillet, and Staller disclose claim limitation 1.02. *See* Pet. 33–39. Petitioner cites Plassmann as disclosing a camera equipped with a positioning system having LEDs that produce low powered light beams 6a, 6b. *Id.* at 33. The LEDs have focusing lenses arranged to cause the light beams 6a, 6b to

¹⁰ Page number refers to page number printed at the bottom of the page of the “Good Practice Guide to the Use of Mavis 2” July 2006.

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converge at a point that is a fixed and desired distance from the apparatus, such that the distance corresponds to the distance where the camera lens is focused. *Id.* at 33–34 (citing Ex. 1007, 12:7–13; Ex. 1003, Declaration of Gerhardt Paul Otto, Ph.D. (“Otto Decl.”) ¶¶ 371–372).

Petitioner contends that a person of ordinary skill would have understood that the device described in Plassmann (i.e., the later generation MAVIS II referred to by Treuillet), like any stereophotogrammetry device, has a depth of field containing many distances at which the camera is focused. *Id.* at 34; *see also id.* at 34 n.5 (citing Ex. 1016, 755; Ex. 1003, Otto Decl. ¶ 374). Petitioner relies on Treuillet to confirm that Plassmann’s device was capable of an expanded depth of field sufficient to image a subject at multiple positions within a 30 cm range, including at least three predefined distance of 65, 80 and 95 cm. *Id.* at 34–37 (citing Ex. 1003, Otto Decl. ¶¶ 116, 377; Ex. 1016, 755). Petitioner argues that both Plassmann and Treuillet describe the use of stereophotogrammetry for wound assessment and monitoring and that Treuillet counsels positioning the device at different distances depending on a wound’s size, locations and healing progress over time. *Id.* at 35–36.

Petitioner cites Staller as disclosing a positioning system employing multiple pairs of light beams to define more than one predefined position. *Id.* at 38. According to Petitioner, a person of ordinary skill would have understood Staller’s disclosure of light beams 56, 57 converging at point 58 on the subject a distance 59, to provide further positioning for taking a picture of a face. *Id.* at 38–39 (citing Ex. 1006, 6:9–15, Fig. 4; Ex. 1003, Otto Decl. ¶ 387). Petitioner argues a person of ordinary skill “would understand Staller’s different light beam pairs, because all intersect along a

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centerline, converge at locations closer to, and farther away from, the device.” *Id.* at 39 (citing Ex. 1003, Otto Decl. ¶ 388).

Petitioner contends that a person of ordinary skill would have had reason to combine the teachings of Plassmann, Treuillet, and Staller. *See id.* at 39–42. Noting that Plassmann and Treuillet are closely related, Petitioner observes that “[t]he device Treuillet describes is identical to that depicted in Plassmann.” *Id.* at 40 n.6 (quoting Ex. 1016, 755, describing MAVIS II as “a reflex digital camera equipped with special dual lens optic for recording two images from slightly different viewpoints, generating a stereo pair” in which “two tube-shaped projectors produce beams of light which intersect in a single spot when the camera is held at the right distance (about 80 cm from the wound”). Petitioner states that, as both Treuillet and Plassmann concern two versions of the same stereophotogrammetry device, a person of ordinary skill would have been motivated to predefine two distances, one closer and one farther away, for different levels of magnification. *Id.* at 39–40. Petitioner further states that “[t]he need to reproducibly image features from these repeatable distances would have further motivated POSITA to apply the teachings of Staller, regarding use of two pairs of light beamers, with the device disclosed in Plassmann/Treuillet, to identify those positions.” *Id.* (citing Ex. 1003, Otto Decl. ¶¶ 138–143, 391).

Patent Owner characterizes Petitioner’s arguments as

modify[ing] Plassmann’s beamers that converge at a different distance than do Plassmann’s already-existing beamers, “including at predefined distances of 65 centimeters or 95 centimeters, as well as all distances in-between,” because Treuillet allegedly teaches that Plassmann has a depth of field (“DOF”) at 65–95 cm, and the prior art teaches imaging a subject at different distances using a single camera.

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PO. Resp. 32. Noting the importance of image focus to 3-D reconstruction of wounds and patient treatment, Patent Owner contends that a person of ordinary skill would not have had reason to modify Plassmann to purposely image at a distance of degraded focus and, in fact, would have been discouraged from doing so. *Id.* at 32–38.

Patent Owner asserts that a person of ordinary skill would understand that focus varies as the distance from the camera changes, including laterally, due to lens curvature and other physical properties. *Id.* at 35. As a result, the focus of a subject at the center of lens differs from the focus at a radial distance from the center, such that the image degrades as radial distance from the center increases. *Id.* Patent Owner further contends that Petitioner’s assertion there are many distances within Plassmann’s depth of field (DOF) sufficient to accurately image a subject is inconsistent with Plassmann’s because Plassmann teaches there is only one distance where the camera is focused and focus degrades at points away from that distance in any direction. *Id.* at 36 (citing Ex. 1007, 12; Ex. 2018, van der Weide Decl. ¶¶ 146–147, 151).

According to Patent Owner, all the references Petitioner cites expressly teach imaging at the optimally focused distance. *Id.* at 37–41. Patent Owner cites, for example, Treuilett’s discussion of MAVIS II as having beams of light that intersect at a single spot the “right distance” for the camera as providing optimal focus and the sharpest image. *Id.* at 37 (citing Ex. 1016, 755; Ex. 2018, van der Weide Decl. ¶ 154). According to Patent Owner “[b]y definition, all other distances are ‘the wrong distance.’” *Id.* (citing Ex. 2018, van der Weide Decl. ¶ 154).

Patent Owner argues that Petitioner’s reliance on Staller as providing a reason to modify Plassmann to place images at distances other than the

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optimum distance is improper because, unlike Staller's uncalibrated 2-D methodology, the scale of Plassmann's 3-D reconstruction is already known exactly from calibration and triangulation and the reconstructions can be viewed at any desired level of magnification. *Id.* at 40. Patent Owner contends, that as a result, there is no benefit derived by modifying Plassmann based on Staller's teachings. *Id.*

As Petitioner points out, however, Patent Owner does not deny that, to the extent that a stereophotogrammetry device is capable of taking adequate images within a depth of field sufficient to accommodate two distances, a person of ordinary skill would have found it obvious to use two pairs of intersecting beamers, such as disclosed in Staller, to denote those distances. Reply 17 (citing Ex. 1053, Supp. Otto Decl. ¶ 65; Ex. 1003, Otto Decl. ¶ 388; Ex. 1006, 5:56–6:2).

Patent Owner further contends that Petitioner's reliance on Treuilett as counseling positioning an imaging device at different distances does not apply to stereophotogrammetry devices, such as that taught by Plassmann, and results from Treuilett's particular imaging method, i.e., using only a standard handheld digital camera to obtain a single image at a time, requiring two images take at different distances at different times. *Id.* at 41 (citing Pet. 35; Ex. 2018, van der Weide Decl. ¶ 168). Patent Owner further argues that Treuilett does not vary distance based on wound size and location, but accounts for these factors by choosing the optical zoom factor of the lens to obtain the best framing. *Id.* (citing Ex. 1016, 756; Ex. 2018, van der Weide Decl. ¶¶ 167, 169).

Noting that Plassmann uses the term MAVIS (not MAVIS II), Patent Owner further contends that the record does not support a conclusion Treuilett's description of MAVIS II refers to the same device as Plassmann.

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PO Resp. 42. Petitioner notes that Plassmann's consistent use of the term MAVIS, without specifying the version of the device, and contends that a person of ordinary skill, would understand that MAVIS in Plassmann (Ex. 1007) also refers to the MAVIS II device. Reply 18–19 (citing Ex. 1054, Transcript of Deposition of Dr. Jean-Phillippe Thirion (Public Version) (“Thirion Tr.”) 87:23–25 (noting the inventor identified the device disclosed in Plassmann (Ex. 1007) as MAVIS II)).

Patent Owner further argues that Treuilett does not mention depth of field (DOF) and does not teach that MAVIS II had a DOF of ± 15 cm. Patent Owner contends that, because wounds are 3-dimensional, Treuilett's device must be able to image a volume of space around the right distance in order to accurately image, reconstruct, and measure wounds and that a person of ordinary skill would understand that imaging away from that right distance increases inaccuracy. PO Resp. 43–44 (citing Ex. 1016, 755; Ex. 2018, van der Weide Decl. ¶ 183). According to Patent Owner, even if Plassmann had a DOF of ± 15 cm, a person of ordinary skill would not modify Plassmann to add beamers at 65 and 95 cm because images at those distances would be degraded and inaccurate. *Id.* at 44 (citing Ex. 2018, van der Weide Decl. ¶¶ 185–186).

Petitioner points out that Patent Owner ignores Petitioner's arguments of distances between 80 and 120 cm. Reply 20 (citing Pet. 49–52). Petitioner further contends that Patent Owner misstates Petitioner's argument. i.e., that a person of ordinary skill would have understood the device depicted in Plassmann, like any stereophotogrammetry device, has a depth of field containing many distances at which the camera is focused and that Treuilett confirms that Plassmann's device has an extended depth of field sufficient to image a subject at multiple positions, included at

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predefined distances of 65 cm and 95 cm, as well as at distances in between.

Id. (citing Ex. 1053, Supp. Otto Decl. ¶ 74)

Patent Owner argues that Treuilett denigrates MAVIS II by calling it cumbersome and unsuitable and plainly criticizes MAVIS II for requiring prior careful calibration to take images at the right distance. *Id.* at 45.

Patent Owner states Treuilett touts that it can

take “free captured” “images at different distances” (*i.e.*, “successive camera positions” that are “unknown”) with “free-handled,” “free zooming” digital cameras, because its images are “uncalibrated,” “requiring no additional equipment or calibration.” Exs. 1016, 752, 755, 756; 2018 ¶189. MAVIS II’s “careful calibration” prevents its use for such free capture of images at different distances. Ex. 2018 ¶189.

Id. at 45–46. According to Patent Owner, “Treuillet’s criticisms are plainly directed to the “unsuitability” of MAVIS II for “taking images at different distances,” and would discourage POSITA from modifying Plassmann to do so. *Id.* at 46. Petitioner notes, however, that Plassmann-style handheld stereophotogrammetry continued to be used after Treulitt’s proposed improvement, notwithstanding the need to calibrate such devices for the nominal distances at which the subject is positioned. Reply 20–21 (citing Ex. 1016, 755; Ex. 1015 (“Hoeffelin”)¹¹; Ex. 1007).

Petitioner replies to Patent Owner’s arguments that a person of ordinary skill would not take images at distances other than the “optimal focus” distance by noting Dr. van der Weide’s acknowledgement that

¹¹ H. Hoeffelin, D. Jacquemin, V. Defaweux, and J L. Nizet, A *Methodological Evaluation of Volumetric Measurement Techniques including Three-Dimensional Imaging in Breast Surgery*, BioMed Research International Volume 2014 Hindawi Publishing Corp. (discussing testing of Patent Owner’s 3D LifeViz system).

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dermatologists and others employ numerous devices designed specifically to image subjects at multiple distances. Reply 14 (citing Ex. 1053, Supp. Otto Decl. ¶ 51); *see also* Ex. 2018, van der Weide Decl. ¶ 166 (acknowledging Treuilett describes a handheld camera taking two images at different distances from the subject at different times). Petitioner further points out that neither Petitioner nor its expert advocates combinations that take blurred photographs, i.e., photographs taken out of the depth of field. Reply 14 (citing Ex. 1053, Supp. Otto Decl. ¶ 62). Petitioner persuasively argues that, contrary to Dr. van Der Weide's assertions, the prior art does not teach a camera's focus must be as high as possible, but need only be located to provide images as sharp as necessary for the application to which the images are to be applied. *Id.* at 16 (citing Ex. 1053, Supp. Otto Decl. ¶ 62). Petitioner points out examples where persons of ordinary skill employ stereophotogrammetry devices to image non-optimally focused area, e.g. where if the leading edge of a face is positioned at an imaging device's focal plane much of the imaged face extends beyond that distance; similarly, when beams intersect on a subject's chest, the breast extends forward of the focal plane and the torso extends beyond it. *Id.* (citing Ex. 1053, Supp. Otto Decl. ¶¶ 61, 62; Ex. 1054, Thirion Tr. 72:4–15, 78:11–79:14).

Finally, as Petitioner notes, much of Dr. van der Weide's testimony concerning less than perfect focus emphasizes 3D reconstruction of anatomical surfaces and medical applications of stereophotogrammetry. Reply 16. The claims are not limited to such application requiring such precision. *Id.*

The preponderance of the evidence, as discussed above and as Petitioner identifies, best supports that a person having ordinary skill in the art would have found it obvious to modify Plassmann's

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stereophotogrammetry device, based on what was known in the art, to have multiple predefined positions for repeatability. Plassmann already teaches use of one pair of light beams for positioning, and a person having ordinary skill in the art would have understood that the Plassmann device could benefit from multiple pairs of light beams in the same way the Staller device benefits from multiple pairs of light beams to enable positioning at more than one repeatable distance from the camera.

Patent Owner does not offer any other substantive arguments concerning claim limitation 1.02. For the reasons discussed above, having reviewed the evidence and arguments of record, we find that Petitioner has demonstrated a person of ordinary skill would have had reason to combine the teachings of Plassmann, Treuilett, and Staller and that their combined teachings would have disclosed or suggested claim limitation 1.02 to such an ordinarily skilled artisan.

c) Objective Indicia

(1) Introduction

Objective indicia of nonobviousness may include long-felt but unsolved need, failure of others, unexpected results, commercial success, copying, licensing, industry praise, and expert skepticism. *Mintz v. Dietz & Watson, Inc.*, 679 F.3d 1372, 1379 (Fed. Cir. 2012). Objective indicia are only relevant to the obviousness inquiry if there is a nexus between the claimed invention and the objective indicia of nonobviousness. *In re Affinity Labs of Tex., LLC*, 856 F.3d 883, 901 (Fed. Cir. 2017). A rebuttable presumption of nexus applies only “when [a patent owner] shows that the asserted objective evidence is tied to a specific product and that product ‘embodies the claimed features, and is coextensive with [the claims].’” *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (quoting

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Polaris Indus. v. Arctic Cat, Inc., 882 F.3d 1056, 1072 (Fed. Cir. 2018)). On the other hand, a patent owner is not entitled to a presumption of nexus if the patented invention is only a component of a commercially successful machine or process. *Id.* (reaffirming the importance of the “coextensiveness” requirement).

Applying *Fox Factory*, the Board uses a two-step analysis in evaluating nexus between the claimed invention and objective evidence of nonobviousness, also referred to as secondary considerations. *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 33 at 33 (PTAB Jan. 24, 2020) (precedential). We consider whether Patent Owner has demonstrated “that its products are coextensive (or nearly coextensive) with the challenged claims,” resulting in a rebuttable presumption of nexus. *Id.* If not, that “does not end the inquiry into secondary considerations”; “the patent owner is still afforded an opportunity to prove nexus by showing that the evidence of secondary considerations is the ‘direct result of the unique characteristics of the claimed invention.’” *Id.* (quoting *Fox Factory*, 944 F.3d at 1373–75). For the reasons discussed below, we find that Patent Owner has not demonstrated that its products are coextensive with the challenged claims and has not demonstrated the requisite nexus with evidence that the secondary considerations are the direct result of the unique characteristics of the claimed invention.

(2) *Coextensiveness*

Patent Owner asserts that its LifeViz Infinity product “is disclosed and claimed in the [’]334 patent,” and that Petitioner does not dispute this assertion. PO Resp. 57 (citing Pet. 75–76). Accordingly, Patent Owner asserts it is entitled to a presumption of nexus of secondary considerations. *Id.* (citing *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1330 (Fed. Cir. 2016)).

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Patent Owner's mere allegation that its LifeViz Infinity product is covered by the claims of the patent is insufficient to establish the claims of the '334 patent and LifeViz Infinity are coextensive. Patent Owner cites the testimony of Dr. van der Weide that: "I have reviewed the LifeViz Infinity device and conclude that it embodies the invention of the ['']334 Patent. More specifically, the Infinity possesses all the features listed in claim 1 of the patent." *Id.* (citing Ex. 2018, van der Weide Decl. ¶ 213). Neither Patent Owner nor Dr. van der Weide offer any analysis that demonstrates the LifeViz Infinity product is coextensive (or nearly coextensive) with the challenged claims. *Id.*; *see also* 37 C.F.R. § 42.65(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.").

Moreover, Patent Owner's reliance on *WBIP* is misplaced. In that case, "WBIP presented evidence that specific products . . . [we]re embodiments of the invention as claimed in the asserted claims," and that provided a basis for finding a presumption of nexus. *WBIP*, 829 F.3d at 1329–31. Such is not the case here.

Patent Owner does not provide the analysis required to demonstrate that Infinity is coextensive (or nearly coextensive) with the challenged claims. PO Resp. 55; *Lectrosonics*, Paper 33 at 33. We, therefore, find that a presumption of nexus is inappropriate.

(3) *Direct result of unique characteristics of the claims*

In the second step of our analysis, we look to whether Patent Owner demonstrates the requisite nexus with evidence that any secondary considerations are the direct result of the unique characteristics of the claimed invention. We address below Patent Owner's arguments directed to

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the secondary considerations of (i) commercial success, (ii) copying, (iii) long-felt need, and (iv) praise for the invention. PO Resp. 57–68.

As an initial matter, we note that throughout its secondary indicia arguments, Patent Owner distinguishes between non-portable devices that can be used for imaging both facial and torso features, e.g. Patent Owner’s LifeViz products and Petitioner’s Vectra H1 products, and portable devices having such dual measurement capability, e.g. Patent Owner’s Infinity product and Petitioner’s Vectra H2 product. *See generally id.* Patent Owner’s emphasis of a long-felt need for a dual-measurement capability portable device and its creation of a new market for such a device, is not commensurate with the language of all the challenged claims of the ’334 patent. Although the Specification states that it discloses a “portable stereophotogrammetry device,” (e.g., Ex. 1022, 3:46), and a device and method “specifically intended to acquire with a single portable stereophotogrammetry camera views of subject at two distances” (*id.* at 11:43–46), the claims recite only a “[d]evice for stereophotogrammetry configured for an acquisition of two views according to two different angles” (*id.* at 11:54–55). Only claim 3 recites that the device is a portable system. Ex. 1022, 12:10–11. Neither party has proposed a construction that limits the remaining claims to a portable device or a device with a single camera.

Petitioner notes that Patent Owner’s long-felt need and commercial success arguments concern imaging both the face and body or fields of view that correspond to those surface areas. Reply 26. Accordingly, Petitioner points out that, because only claims 3, 4, and 11 recite imaging both the face and body, Patent Owner’s long felt need arguments are relevant to the subject matter of claims 3, 4, and 11 of the ’334 patent, at most. *Id.* Patent

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Owner does not address claims 3, 4, and 11 specifically. Petitioner further points out that Patent Owner's evidence and arguments do not demonstrate the existence of a long-felt need addressed by the any of subject matter recited in the challenged claims prior to Patent Owner's introduction of its commercial product. *Id.* at 26–27. The Petition does not discuss LifeViz Infinity, except to point out that Petitioner's expert witness, Dr. Otto, is active in the relevant market and has not seen widespread commercial success, consumer acclaim, or industry praise of LifeViz. Pet. 75–76 (citing Ex. 1003, Otto Decl. ¶¶ 437–439 (noting that Patent Owner alleges LifeViz Infinity is covered by the claims of the U.S. Patent No. 10,070,119 B2 (“the ’119 patent”)¹², U.S. Patent No. 10,163,253 B2 (“the ’253 patent”)¹³, and the ’334 patent that this is the subject of this proceeding)).

As discussed further below, even in the context of claims drawn to a portable, dual distance imaging stereophotogrammetry device, Patent Owner has not provided sufficient evidence that secondary considerations are the direct result of the unique characteristics of the claimed invention

(a) Long-Felt Need

Patent Owner argues that the invention claimed in the ’334 patent addresses a long-felt need. PO Resp. 57–61; Sur-reply 26. Patent Owner acknowledges that in the mid-2000s Dr. Plassmann developed MAVIS II, a system with a pair of light beamers that converge at a distance coinciding with the focal plane of the device at which the image is to be take. PO Resp.

¹² See *Canfield Scientific, Inc. v. QuantifiCare S.A.*, IPR2021-01511, Paper 61 (PTAB March 9, 2023) (Final Written Decision, finding all challenged claims (claims 1–4 and 8–11) unpatentable).

¹³ See *Canfield Scientific, Inc. v. QuantifiCare S.A.*, IPR2021-01518, Paper 61 (PTAB March 9, 2023) (Final Written Decision, finding all challenged claims (claims 1–4, 8–12, 15, 16 and 20–23) unpatentable).

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59. Patent Owner also states that in 2007, it “developed and launched the LifeViz stereophotogrammetry camera,” a device that was “[s]imilar to MAVIS II” and “was a portable, handheld, single camera device with one pair of beamers converging at the focus distance of the camera, and subjects were imaged at that distance.” *Id.* (citing Ex. 2024, Declaration of Dr. Jean-Phillipe Thirion (“Thirion Decl.”) ¶¶ 9–12). Patent Owner states that “LifeViz was configured and marketed for imaging faces” and its experimental use of LifeViz for imaging at distances of 100 cm or more did not provide sufficient resolution for aesthetic and cosmetic purposes. *Id.* (citing Ex. 2024, Thirion Decl. ¶¶ 20–21).

According to Patent Owner “[a]t the time of invention [of the ’334 patent], there were no portable, ‘all-in-one’ handheld stereophotogrammetry devices for imaging both face and breast/torso.” *Id.* at 60 (citing Ex. 2024, Thirion Decl. ¶¶ 25–26, 29). “To image both, practitioners had to purchase one device for face and one for breast/torso, or purchase the large, costly multi-head Canfield XT,” which Patent Owner contends had disadvantages. *Id.* (citing Ex. 2024, Thirion Decl. ¶¶ 25–26, 29; Ex. 1001, 1:49–52).

Patent Owner argues that “[a]ccordingly, since at least the 2007 introduction of LifeViz, there was a long-felt need for a portable single-camera stereophotogrammetry device that avoided the disadvantages of purchasing multiple devices or a multi-head device like the Canfield XT.” *Id.* (footnote omitted) (citing Ex. 2018, van der Weide Decl. ¶ 212; Ex. 2024, Thirion Decl. ¶ 30; Ex. 2025, 4). According to Patent Owner, “[t]o address that deficiency, [Patent Owner] developed Infinity in 2015, filed for a patent thereon on October 14, 2015, and began commercial sales one year later.” *Id.* at 60–61 (citing Ex. 2024, Thirion Decl. ¶¶ 28–29).

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Patent Owner contends that its Infinity product satisfied a long-felt need, as demonstrated by industry praise and commercial success. *Id.* at 61 (citing Ex. 2024, Thirion Decl ¶ 30; Ex. 2025, 4). Patent Owner cites the deposition testimony of Petitioner’s chief technology officer, Dr. Otto, that “it ‘was desired to do breast imaging,’ there was ‘a big demand’ to image ‘both areas,’ and [Petitioner] ‘didn’t want to have a separate product to do breast imaging.’” Sur-reply 26 (citing Ex. 2042, Transcript of October 21, 2022 Deposition of Dr. Paul Otto (“Otto Tr.”) 17:22–18:17). In contrast to demonstrating a long-felt need, however, when taken in context, Dr. Otto’s testimony merely suggests the logical development of a market niche. *See* Ex. 2042, Otto Tr. 18:4–17 (testifying that Petitioner “had for years been making products - - non-portable products which did both face and breast imaging,” that Petitioner “had already developed the H1 portable device which did face imaging, and that was very successful, so there came a question of what next,” and “we didn’t want to have a separate product to do breast imaging, so we thought, okay, how do we do face and breast?”).

“[L]ong-felt need is analyzed as of the date of an articulated identified problem and evidence of efforts to solve that problem.” *Texas Instruments Inc. v. U.S. Int’l Trade Comm’n*, 988 F.2d 1165, 1178 (Fed. Cir. 1993).

Although Dr. Thirion testifies to the capabilities of the 2007 LifeViz product, Patent Owner does not provide evidence showing that the LifeViz product’s single pair of beamers converging at one distance was considered a problem needing solution in 2007. *See* Ex. 2024, Thirion Decl. ¶¶ 9–12. Instead, Patent Owner’s evidence demonstrates that separate commercial products were available to image facial features and breast features. *Id.* ¶¶ 21, 25–26. Patent Owner’s unsuccessful experimentation with certain non-commercial products, does not, by itself, demonstrate the industry

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perceived a long felt need for a product, such as Infinity. PO Resp. 59–60 (citing Ex. 2024 ¶ 20). The incorporation of additional dual distance measurement capabilities into the later generation Infinity product does not evidence the industry perceived a long-felt need that Infinity met. Patent Owner does not provide evidence showing an articulated, identified problem and efforts to solve that problem. Nor does Patent Owner provide evidence that Infinity was met with skepticism or that persons of ordinary skill in the art tried and failed to achieve the claimed invention.

In addition, we are not persuaded by Patent Owner’s attempt to bootstrap its alleged industry praise and commercial success arguments into a demonstration of a long-felt need for the claimed invention. Both commercial success and industry praise can result from exploiting a newly created market niche without the existence of a long-felt need for the claimed subject matter. *See* Ex. 2024, Thirion Decl ¶ 30 (testifying that Infinity created a new market for sales, but not providing direct evidence that a long-felt need had existed in the industry); Ex. 2025, 4 (stating that Infinity “is the first portable 3D imaging system capable of capturing face, body, and breast areas thanks to two sets of dual beamer pointers which allow for two distance settings,” but without stating it met a long-felt need). As discussed above, contrary to Patent Owner’s assertions, Dr. Otto’s deposition testimony is evidence of a logical market development for products with progressively improving capabilities, rather than evidence of an unsolved long-felt need solved by the claimed subject matter. Ex. 2042, Otto Tr. 17:22–18:17.

Patent Owner’s long-felt need based on commercial success arguments are also unavailing. That sales of Patent Owner’s traditional line of products have not been reduced by its introduction of its Infinity dual

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distance product suggests the absence of a long-felt need because its existing products are adequate to meet the needs of the current market, i.e., (i) there has not been a rush to substitute Infinity for the base of installed products and (ii) Infinity sales did not “eat into” current Life Viz Mini or Body sales. *See* PO Resp. 64 (citing Ex. 2025, 4; Ex. 2024 ¶ 36 (“sales of LifeViz Infinity have not significantly impacted sales of its single-distance devices. Rather sales of these devices regularly increased, year by year.”)).

In sum, Patent Owner does not offer sufficient evidence to show a long-felt need solved by the claimed subject matter. Thus, we find that Patent Owner has not shown the requisite nexus between the purported long-felt need and the unique characteristics of the claimed invention.

(b) Praise

Patent Owner begins its industry praise argument by reiterating its assertion that Infinity embodies the invention disclosed and claimed in the ’334 patent and therefore a nexus is presumed. PO Resp. 61 (citing *WBIP*, 829 F.3d at 1330). We find this argument unavailing for the same reasons as those discussed above, i.e., Patent Owner does not demonstrate that a presumption should attach because Patent Owner does not show coextensiveness. *See supra* Section VI.F.1.c.3.a.

Patent Owner also argues Infinity’s receipt of a prestigious award, the 2018 EuroMediCom Best Aesthetic Device Award, establishes nexus based on industry praise. PO Resp. 61 (citing Ex. 2024, Thirion Decl. ¶ 33); Ex. 2025, 1, 4 (announcing LifeViz Infinity as a 2018-2019 Industry Winner for Best Aesthetic Device). Petitioner contends that persons of ordinary skill would know that the subject award may not be an unbiased demonstration of industry praise, as only that subset of industry participants who make a

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payment to EuroMediCom are eligible to be considered for such awards.
 Ex. 1053, Supp. Otto Decl. ¶¶ 76–78.

Patent Owner quotes three portions of the EuroMediCom announcement, and argues that “[t]his praise is squarely directed to the claimed invention.” PO Resp. 61–62 (citing Ex. 2025, 4; Ex. 2018, van der Weide Decl. ¶ 214).

Below we reproduce the entirety of the announcement, italicizing the portions Patent Owner quotes in its Response.

*The **LifeViz® Infinity** is the first portable 3D imaging system capable of capturing face, body, and breast areas thanks to two sets of dual beamer pointers which allow for two distance settings. This unique system has two acquisition modes. A tripod mounted camera and turntable quickly capture a 360° 3D body image. Eight images are automatically taken and seamlessly stitched to produce a “life-like[”] 3D image of the body for visualization by the physician and patient. In hand-held mode, the camera is capable of generating 3D images of face and breast to simulate procedures and photo-document before/after interventions, without blocking an entire exam room with cumbersome equipment.*

With a simple flip of a switch, dual beam pointers adjust to the distance ideal for face or body applications without the need for cumbersome repositioning and/or multi-headed systems. Superior image quality has been achieved by improving the optic performance. The LifeViz® Infinity produces excellent pictures from both near and far thanks to an increased deep field of view. Finally, a powerful external flash removes the need for specific lighting conditions and additional equipment ensuring reproducible images from one session to the next. The LifeViz® Infinity is comprised of a portable stereovision camera, a software suite including an image database, 3D viewer tool, 3D skin analysis, face, breast, and body measurements and simulation modules. All aspects of 3D documentation, comparison, simulation, and measurement ranging from medical to cosmetic applications are possible with this single unique device.

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Ex. 2025, 4 (*italics* emphases added). The announcement broadly describes the Infinity product, including many additional features that the Patent Owner Response does not discuss, including “a tripod mounted camera and turntable”; “[e]ight images are automatically taken and seamlessly stitched to produce a ‘life-like’ 3D image of the body for visualization”; “a powerful external flash”; and “a software suite including an image database, 3D viewer tool, 3D skin analysis, face, breast, and body measurements and simulation modules.” *Id.*

As the announcement touts many features of Patent Owner’s Infinity product, we cannot assess whether praise for Patent Owner’s product is grounded in a claimed feature, or other features, or a combination thereof. Patent Owner does not directly compare the announcement with the challenged claims, and does not clearly identify what Patent Owner contends are the unique characteristics of the claimed invention being praised. Moreover, the challenged claims are of varying scope, and Patent Owner does not address those differences. Accordingly, Patent Owner does not show that the purported praise in the form of the Euro Medi Comm recognition is a direct result of the unique characteristics of the claimed invention.

The Patent Owner Response also cites the comments of three medical professionals’ as evidence of “praise [is] directed to the claimed invention.” PO Resp. 62 (citing Ex. 2026,¹⁴ 11, 19–20). In particular, Patent Owner quotes from Dr. Baie-Bong Lee’s testimonial that “[a]lthough regular 2D pictures are inconvenient, capturing a face or body in 3D with the 3D

¹⁴ *Testimonials: What our customers say*, QuantifiCare, available at <https://www.quantificare.com/learn/testimonials/>; see also *id.* at 2, 8, 10, 17 for additional citations by Patent Owner.

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LifeViz® Infinity is easier. First of all, you have a unique device for standardized photography with a switch that adjusts the ideal distance for face and body.” *Id.* (citing Ex. 2026, 19). Patent Owner does not relate this portion of Dr. Lee’s testimonial to the ’334 patent claims, and fails to show that the purported praise is a direct result of the unique characteristics of the claimed invention.

Patent Owner also quotes the testimonial of Dr. Kian Karimi who describes Infinity as “a state of the art, easy to use photographic system that has become an essential part of our consultation for face and body procedures.” *Id.* (citing Ex. 2026, 20). Describing Dr. Myriam Fopp as one who “uses LV Infinity for face (‘Wrinkles, Pores’) and body,” Patent Owner quotes Dr. Fopp as stating that “[w]e also use our LifeViz® Infinity technology for body treatments.” *Id.* (citing Ex. 2026, 11). None of the subject matter Patent Owner quotes from Dr. Karimi and Dr. Fopp concerns the limitations of the ’334 patent claims.

Patent Owner’s reference to the testimonials of Drs. Lee, Karimi and Fopp is unavailing because Patent fails to show that the purported praise is a direct result of the unique characteristics of the invention claimed in the ’334 patent claims. Based on record as a whole, the evidence of industry praise, is insufficient to support non-obviousness.

(c) *Commercial Success*

Patent Owner begins its commercial success argument by reiterating its assertion that Infinity embodies the invention disclosed and claimed in the ’334 patent and therefore a nexus is presumed. POResp. 63 (citing *WBIP*, 829 F.3d at 1330). We find this argument unavailing for the same reasons as those discussed above, i.e., Patent Owner does not demonstrate that a presumption should attach because Patent Owner does not show

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coextensiveness. *See supra* Section VI.F.1.c.3.a. Therefore, we consider whether Patent Owner demonstrates the requisite nexus with evidence that commercial success is the direct result of the unique characteristics of the claimed invention

For commercial success indicia to support nonobviousness, Patent Owner must “show both commercial success and that a nexus exists between that success and the merits of the claimed invention.” *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1350 (Fed. Cir. 2012). In contrast to its long-felt need arguments, Patent Owner argues commercial success demonstrates “Infinity created a new market in the industry – portable stereophotogrammetry systems for aesthetic and cosmetic fields that could adequately image at more than one distance, *e.g.*, the face and body for medical procedures.” PO Resp. 63–64 (citing Ex. 2024, Thirion Decl. ¶¶ 35–36). As we addressed in our discussion of long-felt need, a market for stereophotogrammetry systems that image at two distances and for portable stereophotogrammetry already existed. *See* Section VI.F.1.c.3.a herein. In its commercial success arguments, Patent Owner limits the market to portable systems that image at two distances and argues the following evidence of commercial success demonstrates the invention accounts for 100% of the sales in that new market: (1) Infinity sales did not reduce sales of Patent Owner’s other products (LifeViz Mini or Body), and (2) Patent Owner controlled 100% of the market prior to Petitioner’s introduction of its H2 product, *i.e.* the only other product in that market. *Id.* at 64–65.

Patent Owner’s commercial success arguments fall short for at least two reasons. First, Patent Owner’s attempt to define a new market (or at least a new sub-market or market segment) limited to portable

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stereophotogrammetry devices that image at two distances does not sufficiently tie the sales of its Infinity product to the claims of the '334 patent to that market. Aside from general allegations that Patent Owner and Petitioner are the only two entities marketing portable systems that image at two distances, Patent Owner's commercial success arguments do not tie its sales of Infinity LifeViz to the claims of the '334 patent.

Second, Patent Owner presents no evidence concerning the market itself. Patent Owner's contention that it initially controlled 100% of the market does not reflect success, but is the natural result of Patent Owner being the first entrant in the market it defines. As Patent Owner presents no arguments concerning the size of the market, e.g., the number of unit sales or the dollar amounts of such sales, there is no evidence as to the scope of the alleged commercial success. Although Patent Owner states that its sales of LifeViz Infinity increased substantially from 0% to 44% of its total sales revenue and is substantially less expensive than Vectra products, Patent Owner does not disclose its total sales, its unit sales, or other information concerning the size of the market. *Id.* at 63 (citing Ex. 2024, Thirion Decl. ¶¶ 30, 35). For example, because Patent Owner provides no evidence concerning the size of the market, we cannot assess whether Patent Owner's alleged success or dominance stems from the market being too small to accommodate additional entrants. Patent Owner also does not address whether other forces, such as up-front investment cost to enter the market segment Patent Owner defines, is a prohibitive barrier, thereby shutting out additional competitors and leaving a larger market share to Patent Owner.

We are also not persuaded by Patent Owner's attempt to bootstrap its alleged industry praise argument into its commercial success argument, by asserting that "customers have identified claimed features as important to

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their use of the invention.” *Id.* (citing *id.* at 61–62 (arguing that the claimed invention has received praise)). These arguments do not address whether any sales, for example, of the Infinity product, resulted from the merits of the claimed invention, or that such purported praise led to actual demand.

We also find unavailing Patent Owner’s argument that “Infinity sales were due to claimed features of the invention, *e.g.*, its ‘dual-distance’ functionality, which permitted customers to avoid buying multiple products or a non-portable multi-head system to accomplish the same tasks – as was noted by the Euro Medi Comm press release.” *Id.* at 64 (citing Ex. 2025,¹⁵ 4). The Euro Medi Comm announcement discussed above identifies the Infinity product as “BEST AESTHETIC DEVICE,” and describes the product, but does not evidence any specific demand for, or sales of, the Infinity product due to any features of the challenged claims. *See* Ex. 2025, 4. Patent Owner also does not sufficiently address whether dual-distance functionality comprises the unique characteristics of the claimed invention.

We also find unavailing Patent Owner’s arguments that Petitioner’s sales of its H2 products relative to its H1 products demonstrates commercial success relative to the claims of the ’334 patent. PO Resp. 65. Patent Owner contends that “[t]he primary functional difference between [Petitioner’s] H2 and H1 [products] is that H2 can image the body (at a different distance) in addition to the face,” and that “[i]t follows that the large differential in production of the H2 as compared to H1 is due to that additional functionality.” *Id.* (citing Ex. 2039¹⁶ (arguing that Vectra H1

¹⁵ *Winners 2018-2019*, EuroMediCom (Jan. 29, 2021) <https://www.euromedicom.com/mca-2018/en/trophy/Winners-2018-2019.html>.

¹⁶ *Vectra H1 Quick Reference Guide*, Canfield (2014).

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images face only); Ex. 2035¹⁷ (arguing that Vectra H2 captures a face or body image). Patent Owner's assertion is mere speculation unsupported by evidence. Patent Owner's analysis fails to consider other possible factors. For example, Petitioner argues that its H2 product has different technical features, such as the ability to refocus at different distances in a manner similar to multiple head prior art devices like the Polaroid MACRO. Reply 19 (citing Ex. 1053, Supp. Otto Decl. ¶¶ 79–81); *see also* Ex. 2041 (2018 H2 Vectra Guide discussing focusing for face, breast, and body imaging); Pet. 36–37; PO Resp. 38.

We also find unavailing Patent Owner's argument that Petitioner "does not contest that its H2 infringes, and thus its sales are relevant to the invention's commercial success." Sur-reply 25 (citing *Truswal Sys. Corp. v. Hydro-Air Eng'g, Inc.*, 813 F.2d 1207, 1215 (Fed. Cir. 1987)) & n. 12 (citing Ex. 2018, van der Weide Decl. ¶¶ 215–219). Patent Owner's reliance on *Truswal* misplaced. First, we note that Patent Owner cites to Judge Rich's dissent in *Truswal*. Second, Judge Rich stated the "once an infringer is sued *and proved to be an infringer*, its sales are appropriately proved and added to the others," and that "[i]t is necessary to establish that the alleged copies are actual infringements of the patent in suit before they can possibly be relevant and counted as successes *of the patented invention*." *Truswal*, 813 F.2d at 1215 (Rich, J., dissenting). Although Patent Owner alleges that H2 infringes, Petitioner has not been adjudged to infringe. We do not decide infringement in this forum and we find insufficient support for Patent Owner's assertion that Petitioner does not contest infringement.

¹⁷ *Vectra H2: Capturing a FACE or BODY image*, Canfield.

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In sum, we find that Patent Owner does not show sufficient nexus between the purported commercial success and the claimed invention, and fails to show commercial success.

(d) *Copying*

Patent Owner argues that Petitioner’s Vectra H2 “is a copy of *the invention*, in structure, function, operation, and use.” PO Resp. 66–68 (emphasis added). According to Patent Owner, Petitioner’s Vectra H2 mimics patented features of Infinity and unpatented color coding features, i.e., the use of red light beamers for closer imaging of the face and green light beamers for farther imaging of the torso. *Id.* at 66. Patent Owner also notes that Petitioner launched its H2 device “[e]ighteen months after [Patent Owner] launched its Infinity.” *Id.*

Petitioner replies that it did not copy Patent Owner’s invention and states that technical distinctions exist between Patent Owner’s purported invention and Petitioner’s Vectra H2 product. Reply 29 (citing Ex. 1053, Supp. Otto Decl. ¶¶ 79–81). Petitioner also states that its Vectra H2 can refocus at different distances, a design feature in prior art systems, e.g. Polaroid’s MACRO devices, that Patent Owner acknowledges is distinct from its invention. *Id.* at 29–30 (citing Ex. 1054, Thirion Tr. 127:6–128:17). As to the unpatented beamer colors, Petitioner’s expert, Dr. Otto, credibly testifies that Petitioner’s choice of red and green light beamers was made for functional reasons (it is easier to get bright LEDs in red and green than in other colors). *Id.* (citing Ex. 1053, Supp. Otto Decl. ¶¶ 80–81).

Notwithstanding similarities between the Patent Owner’s and Petitioner’s products, Patent Owner lacks sufficient evidence that Petitioner copied the ’334 patent or any claim of the ’334 patent. Patent Owner cites no evidence, for example, that Petitioner was aware of the ’334 patent

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during development of the H2 device. *See* Ex. 2042, Otto Tr. 19:5–16, 157:7–16 (Dr. Otto testifying that he was unaware of Patent Owner’s Infinity product at the time he worked on Petitioner’s H2 product). Patent Owner further lacks evidence that any particular aspect of the ’334 patent was copied. *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995) (“[M]ore than the mere fact of copying by an accused infringer is needed to make that action significant to a determination of the obviousness issue.”) (citation omitted).

Patent Owner also lacks evidence that Petitioner copied any patented product. As we explain above, Patent Owner lacks evidence that the Infinity product is coextensive or nearly coextensive with any challenged claim; the record, thus, does not establish that Infinity is a “patented product” in a relevant sense.

“Copying requires evidence of efforts to replicate a specific product, which may be demonstrated through internal company documents, direct evidence such as disassembling a patented prototype, photographing its features, and using the photograph as a blueprint to build a replica, or access to the patented product combined with substantial similarity to the patented product.” *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010). Patent Owner lacks evidence that Petitioner studied any Patent Owner product or documents when developing the H2 device. To the contrary, the preponderance of the evidence supports that Petitioner’s H2 product differs from Patent Owner’s product, including because it refocuses at different distances (a design present in prior art systems). Ex. 1053, Supp. Otto Decl. ¶¶ 79–81; *see also* Reply 29.

Thus, based on the record as a whole, Patent Owner’s allegation of copying is unpersuasive and does not support non-obviousness.

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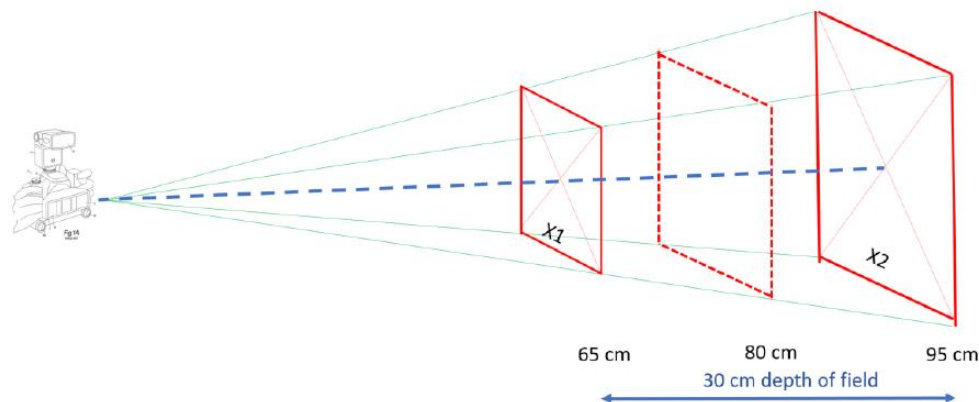
(4) *Conclusion*

Having considered the arguments and evidence of record we find that Patent Owner has not demonstrated that the claims are coextensive with any of its products and that Patent Owner has not demonstrated that the secondary considerations are the direct result of the unique characteristics of the claimed invention.

2. *Claims 11 and 12*

Claim 11 depends from claim 1 and recites that the closer distance position (A4) and the farther distance position (A3) are such that the surface of the field of view corresponding to the farther distance position (A3) is at least 25% larger than a surface of a field of the view corresponding to the closer distance position (A4). Accordingly, Petitioner notes that claim 11 recites two predefined distances where the surface of a field of view differs in the area by at least 25%. Pet. 47.

The Petition includes the illustrative figure shown below.



Id. at 48 (citing Ex. 1003, Otto Decl. ¶ 285). Petitioner states that the figure illustrates rectangular areas X1, X2 for the MAVIS device disclosed in Plassmann and Treuilett, with the closest and farthest distance is falling within its 30 cm depth of field. *Id.* Petitioner notes that as one moves further from the device shown on the left, the imaged area gets larger, such

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that X2 is always larger than X1 and contends that a farther position imaging at least 25% more than a closer position would have been obvious. *Id.* (citing Ex. 1003, Otto Decl. ¶ 285).

Petitioner notes that Plassmann and Treuilett both disclose using the Plassmann device to monitor wounds and that a person of ordinary skill would have been familiar with the principle that photographic devices used for that purpose employ multiple, predefined distances closer in position that differ in magnification from its farthest position by more than 25%. *Id.* at 48–49 (citing Ex. 1017; Ex. 1003, Otto Decl. ¶ 286). Although neither Plassmann nor Treuilett discloses the actual focal length of their lenses, Dr. Otto states that a person of ordinary skill would understand such devices may be used with any lens suitable to the subject. *Id.* at 50 (citing Ex. 1003, Otto Decl. ¶ 290). Dr. Otto confirms that devices of Plassmann’s design employing 34 mm focal length lenses could provide a 30 cm depth of field centered at 80 cm distance sufficient to encompass a field of view roughly equivalent to the A4 format and one equivalent to the A3 format (i.e., differing by more than 25%). *Id.* at 49–50 (citing Ex. 1003, Otto Decl. ¶¶ 288–292). Dr. Otto further testifies that a person of ordinary skill would know that employing dual 34 mm lenses allows configuration of the device to encompass a field of view a fraction larger than A4 at 65 cm from the device and in the field of view of A3 at 93.9 cm, both within the depth of field reported in Treuilett, whose fields of view differ in size by more than 25%. *Id.* at 50 (citing Ex. 1003, Otto Decl. ¶¶ 160–172, 292).

Petitioner further contends that a person of ordinary skill would have known of prior art publications describing the use of hand-held devices with similar dual-optic designs suitable for imaging the face and body, e.g., the LifeViz II device that can have a depth of field extending 80–120 cm. *Id.* at

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51 (citing Ex. 1015, noting LifeViz II permitted distortion free consistent imaging within a 40 cm range). Patent Owner contends that Petitioner's reference to LifeViz II (and Hoefflin) as a single device that could image face and torso is incorrect. PO Resp. 51–54. Even if Patent Owner is correct that Petitioner mis-identified LifeViz II and Hoefflin as a dual-optic design, Petitioner argues that a person of ordinary skill would have known that the device described in Plassmann and Treulitt could be configured with various lenses and different focal lengths and depths of field (e.g., by adjusting the aperture setting of the lens) at various distances as needed to image particular subjects and to configure such devices to define closer and farther imaging positions, where the area of the subject recorded at the farther position is at least 25% larger than at the closer position, as claimed. Pet. 52 (citing Ex. 1003, Otto Decl. ¶ 172).

Patent Owner argues that neither Plassmann nor Treuilett identifies or discusses field of view and that Dr. Otto's model is incorrect. PO Resp. 47–49 (citing Ex. 2018, van der Weide Decl. ¶¶ 195, 203). According to Patent Owner, Dr. Otto's model is based on a single pyramidal view frustum extending from the centerline of the camera and within that frustum Petitioner depicts the supposed field of view at a distance from the camera as a rectangular area perpendicular to the centerline. *Id.* (citing Ex. 2018, van der Weide Decl. ¶ 106). Patent Owner contends that Dr. Otto's model is flawed because a stereophotogrammetry camera is not a singular frustum, as discussed by Dr. Otto, but the intersection of two separate view frustums of the sub-optics, and the field of view at a particular distance from the camera is defined by the intersection of those two frustums at that distance. *Id.* (citing Ex. 2018, van der Weide Decl. ¶ 197). According to Patent Owner,

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Dr. Otto's model results in locations where the subject is not imaged at all. *Id.* at 50; Ex. 2018, van der Weide Decl. ¶ 198.

Petitioner characterizes Patent Owner's argument as "assert[ing] that the calculations fail to account for monocular areas where the fields of view of the two suboptics do not overlap." Ex. 1053, Supp. Otto Decl. ¶ 67 (citing Ex. 2018, van der Weide Decl. ¶¶ 196–198) and that these monocular areas are insignificant. Patent Owner denies that Dr. van der Weide discussed monocular areas, but argued "rather that a stereophotogrammetry device's field-of-view is more limited than a single-view system," particularly in non-parallel systems, like those of the invention, where the crisscrossing pyramidal views first coverage/overlap and then diverge and cease to overlap at certain distances from the camera, after which there is no stereo field of view at all. Sur-reply 22–23 (citing Ex. 2018, van der Weide Decl. ¶¶ 197–198, 104, referencing Patent Owner's annotated Figure 2 of the '334 patent). We note, however, that Patent Owner extensively discusses parallel configuration with a monocular area to the left and right of the stereoscopic binocular area in the center. *See* PO Resp. 5–6 (including a similar figure as that shown on page 50 of the Response); Ex. 2018, van der Weide Decl. ¶ 68. Petitioner emphasizes that for angled sub-optics, such as those in Plassmann, the dimensions of this monocular area would be insignificant and did not need to be addressed in Dr. Otto's illustrative calculations and that Dr. van der Weide does not assert that configuration as described by Otto (or others a person of ordinary skill would have routinely configured) would not have been capable of meeting the requirements of claim 11. Reply 22 (citing Ex. 1053, Supp. Otto Decl. ¶ 68).

For purposes of assessing the recitation in claim 11 that the surface of a field of view at farther distance A3 is 25% larger than at closer distance

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A4, we need not decide the merits of the parties competing contentions concerning single or intersecting pyramidal frustums. We understand Dr. Otto's discussion merely to be illustrative of the principle that as one moves farther from the device, the imaged area is larger. Pet. 47–48. As neither party disputes this principle, we turn our attention to their remaining arguments concerning claim 11.

Patent Owner contends that Petitioner fails to consider the degradation in sharpness laterally from the optical axis. PO Resp. 50. Petitioner contends this effect is negligible. Reply 22. Neither party provides a detailed analysis of this effect. In any case, the degree of sharpness is not a limitation recited in claim 11; we direct our attention to whether a person of ordinary skill would have understood that the surface image at farther distance A3 is larger than at closer distance A4.

As discussed above, Dr. Otto contends that a person of ordinary skill would recognize that common 34 mm and 42 mm lenses could be employed to permit imaging at two distances where the surface field of view at the further distance exceeds that of the closer distance by at least 25%. *See also* Reply 23. Petitioner disputes Patent Owner's contentions that Dr. Otto failed to consider the apertures available for such lenses and that apertures that would permit such imaging are not available; Petitioner argues that most lenses come with a wide range of apertures suitable for such use. *Id.* Except to argue that Petitioner did not previously argue that Hoefflin employed an available aperture, Patent Owner does not reply to these arguments. *See* Sur-reply 24. Instead, Patent Owner contends that Petitioner summarily concludes a person of ordinary skill would understand how to select "unknown optical characteristics" missing from Dr. Otto's analysis. As discussed above, Petitioner acknowledges that neither Plassmann nor

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Treulleit discloses the actual focal length of their lenses, but Dr. Otto states that a person of ordinary skill would understand such devices may be used with any lens suitable to the subject. Pet. 50. We agree with Petitioner that Dr. Otto's testimony provides sufficient reasoning with rational underpinning to support the proposition that a person of ordinary skill in the art would have known how to select the requisite lenses to achieve the results recited in claim 11. *See KSR*, 550 U.S. at 418 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring "articulated reasoning with some rational underpinning to support the legal conclusion of obviousness"))).

Having considered the arguments and evidence of record, for the reasons discussed above, we find that Petitioner has demonstrated that a person of ordinary skill would have had reason to combine the teaching of Plassmann, Treulleit, and Staller and that their combined teachings would have disclosed or suggested the subject matter of claim 11 to a person of ordinary skill.

Claim 12 depends from claim 11 and recites fields of view at closer position (A4) equal to an A4 surface format, plus 100% or minus 40%, and the farther position (A3) equal to an A2 surface format, plus 100% or minus 40%. Citing its arguments concerning claim 11, Petitioner argues that it would have been within the routine skill of an ordinarily skilled artisan to configure a variety of lens configurations using Plassmann's device to provide various fields of view, including ones with the claimed dimension, to capture the larger areas of a subject's body. Pet. 53–56. Patent Owner repeats its assertions that Dr. Otto's analysis of claim 12 is flawed. PO Resp. 56–57. For similar reasons as those we articulated concerning claim 11, we find that Petitioner has demonstrated that a person of ordinary skill

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would have had reason to combine the teaching of Plassmann, Treuilitt, and Staller and that their combined teachings would have disclosed or suggested the subject matter of claim 12 to a person of ordinary skill.

3. *Claims 2–5, 9, 10, 15, 16, and 20*

Claims 2–5, 9, 10 and 12 are device claims that depend directly or indirectly from claim 1. Claims 15, 16, and 20 directly or indirectly recite a method using the device recited in claim 1. We have reviewed Petitioner’s arguments and evidence regarding these claims. Patent Owner does not address these claims separately and has waived argument concerning them. Based on the arguments and evidence of record, we find that Petitioner has demonstrated that a person of ordinary skill would have had reason to combine the teachings of Plassmann, Treuilett, and Staller and that the combined teachings of these references would have disclosed or suggested the limitations of claims 2–5, 9, 10, 15, 16 and 20 to an ordinarily skilled artisan.

G. *Claims 21–23 As Obvious Over Plassmann, Treuillet, Staller and Peng*

Claims 21–23 are method claims that depend directly or indirectly from claim 15. Claim 15 recites a method of using the device recited in claim 1. Claims 21–23 are directed to reconstructing 3-D dimensional surface of the target subject. *See* Ex. 1022, 14:48–15:19. Petitioner observes “[t]he ’334 patent does not explain how POSITA is to perform these steps, stating only such processing be performed ‘by a program in a computer’” and “[t]he use of a stereo-pair of images to reconstruct a 3-Dimensional surface would have been well-known to POSITA—this is the primary purpose in stereophotogrammetry for such image pairs.” Pet. 61, 63 (citing Ex. 1022, 7:42–47; *see also id.* at 10:38–48; Ex. 1003, Otto Decl.

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¶¶ 334, 428). Nevertheless, noting that Peng “discusses methods for ‘3D model stitching for adjacent scenes’ from multiple stereo-pairs . . . by spatially matching at least three noncollinear points between different 3D models,” Petitioner cites Peng as “disclos[ing] reconstruction of comprehensive 3D geometries using passive, image-based methods, such as those referred to in Plassmann and Treuillet.” *Id.* at 66–67 (citing Ex. 1009, 1–6; Ex. 1003, Otto Decl. ¶¶ 342, 346, 428).

Patent Owner does not address claims 21–23, except to argue that Peng does not cure the deficiencies Patent Owner pointed out with respect to claim 1. PO Resp. 68.

Having considered all the arguments and evidence of record, we find that Petitioner has demonstrated that a person of ordinary skill would have had reason to combine the teachings of Peng with those of Plassmann, Treuillet and Staller and that their combined teachings would have disclosed or suggested the limitations of claim 21–23 to such an ordinarily skilled artisan.

VII. MOTION TO EXCLUDE

Patent Owner’s Motion to Exclude seeks to exclude two areas of evidence. We address each in turn.

A. *Exclusion of Dr. Otto’s Testimony to the Extent it Espouses and Relies on Inadmissible Hearsay*

Patent Owner argues that testimony of Petitioner’s witness, Dr. Otto, should be excluded to the extent Dr. Otto relies on statements regarding the depth of field of the MAVIS II system discussed in Treuillet because Treuillet’s statements are hearsay and not the kinds of fact an expert would reasonably rely upon. Mot. to Excl. 1–13. Patent Owner further argues that Treuillet’s description of MAVIS II is inconsistent with Plassmann’s

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writings concerning MAVIS II and should be excluded for this reason as well. *Id.* at 13–14.

Patent Owner’s arguments for exclusion are unpersuasive for at least three reasons. First, as Petitioner argues in opposition to the motion to exclude, Treuillet is admissible as prior art. Opp. Mot. Excl. 2–3. Petitioner and Dr. Otto rely on Treuillet for what the Treuillet reference teaches to a person having ordinary skill in the art at the relevant time. Treuillet’s suggestions to a person having ordinary skill in the art remain relevant even if Treuillet were factually incorrect in some respects.

Second, even if considered hearsay, Dr. Otto properly relied on Treuillet. *Id.* at 4–7. Federal Rule of Evidence 703 provides that an expert may rely on facts and data that “need not be admissible.” Here, the evidence supports that Treuillet was published in an independent, respected, and peer-reviewed IEEE journal. *Id.* at 5–6 (citing evidence regarding reliability of the IEEE journal). Thus, Treuillet is the kind of evidence we would expect an expert witness or person having ordinary skill in the art to rely upon, and Dr. Otto was entirely reasonable on relying on Treuillet in forming his opinions.

Third, even if Treuillet were inconsistent with other evidence, such as Plassmann, this issue goes to the credibility of Dr. Otto’s testimony and the weight given to it in deciding ultimate issues of fact, rather than its admissibility.

For the reasons above, we deny Patent Owner’s motion to exclude with respect to Dr. Otto’s testimony.

B. Exhibits 1018, 1019, 1026, 1028, 1029, 1030, and 1033

Patent Owner seeks to exclude Exhibits 1018, 1019, 1026, 1028, 1029, 1030, and 1033 because “the Petition does not cite or otherwise rely

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on them.” Mot. to Excl. 15. Petitioner argues that it relied on exhibits 1026, 1029, 1030, 1033 and 1034, in the Petition and in cited paragraphs of Dr. Otto’s declaration. Opp. Mot. Excl. 12 (citing, e.g., Pet. 5, 38, 44, 46–47, 53–58, 60, 72, 75; Ex. 1003, Otto Decl. ¶¶ 161–163, 323, 390–391, 410, 413–414). Petitioner acknowledges that it did not rely on Exhibits 1018, 1019, and 1028, but argues that Patent Owner’s request is unnecessary and should be denied as moot. *Id.*

In rendering our decision, we only consider Petitioner’s evidence to the extent it is properly presented in the Petition or the Reply. We consider Petitioner’s evidence that Dr. Otto cites only to the extent explanation of the evidence is properly presented in the Petition or the Reply or only for purposes of assessing whether Dr. Otto’s testimony presented in the Petition or the Reply is well-grounded. As such, resolution of Patent Owner’s motion to exclude with respect to these exhibits would have no affect our decision making and is therefore moot.

VIII. PATENT OWNER’S OBJECTION TO DEMONSTRATIVES

Patent Owner objects to certain of Petitioner’s demonstratives for oral argument because, for example, the demonstratives constitute evidence that Petitioner did not reference or discuss in a prior paper, according to Patent Owner. *See, e.g.*, Paper 57 (“PO Objs.”) 2. Patent Owner also objects to certain demonstratives as mischaracterizing the record. *Id.* at 1.

Demonstratives for oral argument are not evidence, and we do not rely on demonstratives as evidence in our decision making. Paper 44, 3. Because demonstratives are not evidence and we do not rely on them in making our decision making, Patent Owner’s objections to the demonstratives likewise do not affect our decision making and are therefore moot.

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IX. CONCLUSION¹⁸

Having considered the arguments and evidence on record, we conclude the Petitioner has demonstrated by a preponderance of the evidence that all the challenged claims are unpatentable.

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–5, 9–12, 15, 16, 20	103	Plassmann, Treulett, Staller	1–5, 9–12, 15, 16, 20	
21–23	103	Plassmann, Treulett, Staller, Peng	21–23	
Overall Outcome			1–5, 9–12, 15, 16, 20–23	

X. ORDER

In consideration of the above it is:

ORDERED that claims 1–5, 9–12, 15, 16, and 20–23 are unpatentable;

FURTHER ORDERED that Patent Owner’s Motion to Exclude is denied with respect to evidence addressed by Section VII.A, *supra*, and is

¹⁸ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. §§ 42.8(a)(3), (b)(2).

IPR2021-01519

Patent 10,681,334 B2

dismissed as moot with respect to evidence addressed by Section VII.B,
supra;

FURTHER ORDERED that Patent Owner's Objections to Petitioner's
Demonstratives are overruled; and

FURTHER ORDERED that that, because this is a Final Written
Decision, parties to the proceeding seeking judicial review of the decision
must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2021-01519
Patent 10,681,334 B2

FOR PETITIONER:

Michael Weiner
Thomas L. Duston
MARSHALL, GERSTEIN & BORUN LLP
mweiner@marshallip.com
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FOR PATENT OWNER:

Mark Giarratana
Kevin Reiner
McCARTER & ENGLISH, LLP
mgarratana@mccarter.com
kreiner@mccarter.com

**UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT**

**QUANTIFICARE S.A.,
Patent Owner/Appellant**

v.

**Appeal Nos. 2023-1917¹
2023-1918
2023-1919**

**CANFIELD SCIENTIFIC, INC.,
Petitioner/Appellee**

Proceeding Nos.: IPR2021-01511, IPR2021-01518 and IPR2021-01519

NOTICE FORWARDING CERTIFIED LIST

A Notice of Appeal to the United States Court of Appeals for the Federal Circuit was timely filed May 9, 2023 and May 12, 2023, respectively, in the United States Patent and Trademark Office in connection with the above identified *Inter Partes Review* proceedings. Pursuant to 35 U.S.C. § 143, a Certified List is this day being forwarded to the Federal Circuit.

Respectfully submitted,

Date: June 28, 2023

By: Macia L. Fletcher
Macia L. Fletcher
Paralegal
Mail Stop 8
P.O. Box 1450
Alexandria, VA 22313-1450
571-272-9035

Under Secretary of Commerce for Intellectual Property and
Director of the United States Patent and Trademark Office

¹ Appeal No. 2023-1917 (Lead) is consolidated with Appeal Nos. 2023-1918 and 2023-1919 (Member Cases) pursuant to Court Order (Dkt. No. 11) and Note to File (Dkt. No. 12) dated June 6, 2023.

Case: 23-1917 Document: 13 Page: 2 Filed: 06/29/2023

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy of the foregoing NOTICE FORWARDING CERTIFIED LIST has been served, via electronic mail, on counsel for Appellant and Appellee this 28th day of June, 2023, as follows:

<u>PATENT OWNER:</u> Mark D. Giarratana Kevin Reiner MCCARTER & ENGLISH, LLP mggiarratana@mccarter.com kreiner@mccarter.com	<u>PETITIONER:</u> Thomas Lee Duston Chelsea Murray Isha S. Shah Michael R. Weiner MARSHALL, GERSTEIN & BORUN LLP tduston@marshallip.com cmurray@marshallip.com ishah@marshallip.com mweiner@marshallip.com
--	--

By: Macia L. Fletcher
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Alexandria, VA 22313-1450
571-272-9035

U.S. DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

June 28, 2023

(Date)

THIS IS TO CERTIFY that the attached document is a list of the papers that comprise the record before the Patent Trial and Appeal Board (PTAB) for the *Inter Partes Review* proceeding identified below.

CANFIELD SCIENTIFIC, INC.,
Petitioner,

v.

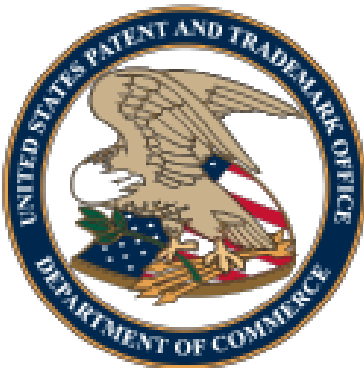
QUANTIFICARE S.A.,
Patent Owner.

Case: IPR2021-01511
Patent No. 10,070,119 B2
By authority of the

DIRECTOR OF THE UNITED STATES
PATENT AND TRADEMARK OFFICE

Macia L. Fletcher

Certifying Officer



Prosecution History ~ IPR2021-01511

Date	Document
9/7/2021	Petition for Inter Partes Review
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Case: 23-1917 Document: 13 Page: 5 Filed: 06/29/2023

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U.S. DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

June 28, 2023

(Date)

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CANFIELD SCIENTIFIC, INC.,
Petitioner,

v.

QUANTIFICARE S.A.,
Patent Owner.

Case: IPR2021-01518
Patent No. 10,165,253 B2
By authority of the

DIRECTOR OF THE UNITED STATES
PATENT AND TRADEMARK OFFICE

Macia L. Fletcher

Certifying Officer



Prosecution History ~ IPR2021-01518

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Case: 23-1917 Document: 13 Page: 8 Filed: 06/29/2023

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**U.S. DEPARTMENT OF COMMERCE
United States Patent and Trademark Office**

June 28, 2023

(Date)

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**CANFIELD SCIENTIFIC, INC.,
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v.

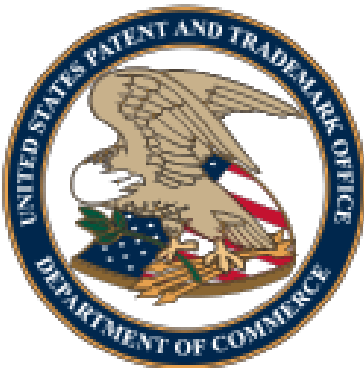
**QUANTIFICARE S.A.,
Patent Owner.**

**Case: IPR2021-01519
Patent No. 10,681,334 B2**
By authority of the

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PATENT AND TRADEMARK OFFICE**

Macia L. Fletcher

Certifying Officer



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Case: 23-1917 Document: 13 Page: 11 Filed: 06/29/2023

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CANFIELD SCIENTIFIC, INC.,
Petitioner,

v.

QUANTIFICARE S.A.,
Patent Owner.

IPR2021-01511
Patent 10,070,119 B2

Before BRIAN J. MCNAMARA, JOHN D. HAMANN, and
BRIAN D. RANGE, *Administrative Patent Judges*.

RANGE, *Administrative Patent Judge*.

JUDGMENT

Final Written Decision

Determining All Challenged Claims Unpatentable

Denying In Part and Dismissing In Part Patent Owner's Motion to Exclude

35 U.S.C. § 318(a)

I. INTRODUCTION

This is a Final Written Decision addressing the *inter partes* review challenging claims 1–4 and 8–11 of U.S. Patent No. 10,070,119 B2 (“the ’119 patent,” Ex. 1001). We have jurisdiction under 35 U.S.C. § 6. The evidentiary standard is a preponderance of the evidence. *See* 35 U.S.C. § 316(e) (2018); 37 C.F.R. § 42.1(d) (2019). We issue this Final Written Decision pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73 (20222). For the reasons that follow, we determine that Canfield Scientific, Inc. (“Petitioner”) demonstrates, by a preponderance of the evidence, that the challenged claims are unpatentable.

II. BACKGROUND

A. *Procedural History*

Petitioner filed a Petition (Paper 1, “Pet.”) requesting *inter partes* review of claims 1–4 and 8–11 of the ’119 patent. After institution, QuantifiCare S.A. (“Patent Owner”) filed a Patent Owner Response. *See* Paper 21 (“PO Resp.”). Petitioner filed a Reply (Paper 30, “Reply”), and Patent Owner filed a Sur-Reply (Paper 42, “PO Sur-reply”). Additionally, Patent Owner filed a motion to exclude evidence (Paper 46, “Mot. Excl.”), Petitioner responded (Paper 47, “Opp. Mot. Excl.”), and Patent Owner provided a reply brief (Paper 53, “Mot. Excl. Reply”).

We heard oral argument for this *inter partes* review (as well as for two related *inter partes* reviews, IPR2021-01518 and IPR2021-01519) on December 14, 2022, and a transcript of the hearing is part of the record of this proceeding. Paper 60 (“Tr.”).

B. *Related Matters*

The parties identify the following as a related matter: *QuantifiCare, Inc. v. Canfield Scientific, Inc.*, C.A. No. 1:20-cv-12305 (D.N.J.). Pet. 3;

IPR2021-01511
Patent 10,070,119 B2

Paper 4, 1. In addition, Petitioner has filed a petition for *inter partes* review of two additional patents related to the '119 patent that are also owned by Patent Owner: (i) U.S. Patent No. 10,165,253 B2 (IPR2021-01518) and (ii) U.S. Patent No. 10,681,334 B2 (IPR2021-01519).

C. The '119 Patent (Ex. 1001)

The '119 patent is titled “Device and Method to Reconstruct Face and Body in 3D.” Ex. 1001, code 54. The challenged patent relates to a stereophotogrammetry device used “to picture and reconstruct in 3D the surface of objects of different sizes,” e.g., different body parts such as the face and the torso. *Id.* at 3:22–25; *see id.* at 1:6–14, 1:41–48. By way of background, the '119 patent explains that “[s]tereophotogrammetry consists in [simultaneously] gathering the images of a subject from at least two views with a calibrated camera,” i.e., a “stereo-pair.” *Id.* at 1:24–29. The stereo-pair is used to “reconstruct . . . a dense representation in 3-Dimensions of the surface of the observed object.” *Id.* at 1:30–32.

Figures 1 and 2, reproduced below, respectively show side- and top-views of an “implementation” of a stereophotogrammetry device and its components. *Id.*

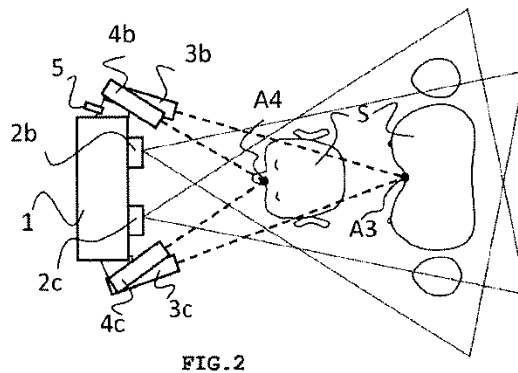
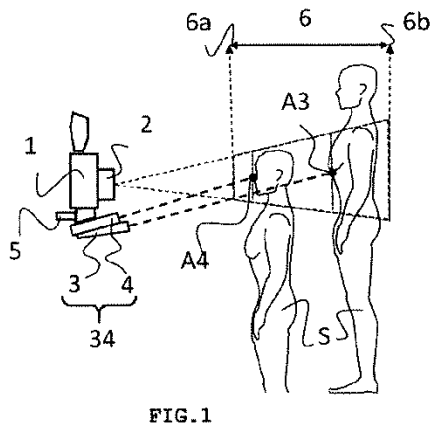


Figure 1 represents a possible implementation of the '119 patent's device as viewed from the side, and Figure 2 represents a possible implementation of the device as viewed from the top. *Id.* at 3:48–51. As shown in Figures 1 and 2, camera body (1) includes double optics (2). *Id.* at 8:23–24. As shown in Figure 2, double optics (2) are “composed of two sub-optics (2*b*) and (2*c*), enabling the acquisition of a stereo[-]pair [of images] corresponding to two slightly different viewing angles” simultaneously. *Id.* at 8:24–27; *see id.* at 3:28–31. For example, Figure 8, shown below, shows a series of stereo-pair images taken at different angles for a face. *Id.* at 11:1–8.

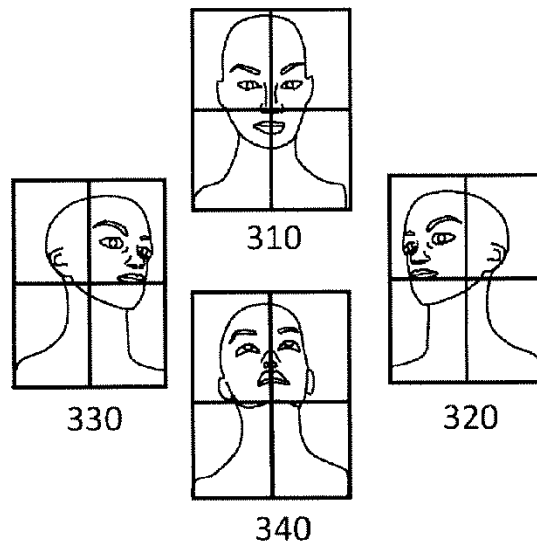


FIG. 8

The '119 patent specification describes Figure 8 as presenting “viewpoints optimized for imaging a face using a field of view close to an A4 surface format.” *Id.* at 3:66–67. Using the captured stereo-pairs, “a comprehensive representation in 3D of the surface of the subject (S)” can be constructed. *Id.* at 10:26–37.

Further, the stereophotogrammetry device captures stereo-pairs of images at “two distinct distances for picture taking corresponding respectively to position (A3) and (A4)” such that the stereo-pairs of images are in focus at positions A3 and A4, which are within the device’s depth of field 6. *Id.* at 8:29–39; *see id.* at 6:23–26. For example, position A3 is used for capturing images of the torso while position A4 is used for capturing images of the face. *Id.* at 6:3–12; *see id.* at 1:41–48. Positions A3 and A4 can be identified by the convergence of respective light patterns projected onto the subject to be imaged, the respective light patterns converging at the distances for positions A3 and A4. *Id.* at 4:46–67. For example, as shown in Figure 2, a light pattern emitted by first pair of light beamers (3b) and (3c) converge at point (A3) and a different light pattern emitted by second pair of light beamers (4b) and (4c) converge at point (A4). *Id.* at 8:40–44; *see id.* at 4:56–59. Accordingly, “by placing the subject so that the light patterns projected by a first pair of beamers are superposed on the surface of the subject[,] one is placing the subject at” the first pre-defined position (and similarly for the light pattern emitted by the second pair of beamers converging at the second position). *Id.* at 4:48–56; 5:10–26.

D. Challenged Claims

Petitioner challenges claims 1–4 and 8–11 of the ’119 patent. Pet. 1. Claim 1 is the only challenged independent claim. Claim 1 is illustrative of the claimed subject matter, and we reproduce claim 1 with Petitioner’s added bracketed identifiers and line breaks for claim elements.

1. [1.01] A device for stereophotogrammetry comprising
[1.02] a camera body (1) and

[1.03] a double-optics (2) comprising two sub-optics (2*b*) and (2*c*), configured for a simultaneous acquisition of two views according to two different angles,

[1.04] wherein the device is comprising a positioning system (34) configured to define a position of a target subject (S) for one of at least two distinct pre-defined point positions (A3, A4) of the target subject (S) relative to the stereophotogrammetry device,

[1.05] the at least two distinct predefined point positions comprising a closer point position (A4) and a farther point position (A3), the closer point position (A4) being closer to the stereophotogrammetry device than the farther point position (A3), and wherein the positioning system (34) is comprising at least two pairs of light beamers (3*b*, 3*c*) and (4*b*, 4*c*) where a first pair of light beamers (3*b*, 3*c*) is converging to the farther point position (A3) and a second pair of light beamers (4*b*, 4*c*) is converging to the closer point position (A4), and

[1.06] wherein the device comprises a switch (5) comprising a first selection position configured to select the farther point position (A3) and a second selection position configured to select the closer point position (A4),

[1.07] wherein the switch (5) is configured to switch on the first pair of light beamers (3*b*, 3*c*) in the first selection position and wherein the switch (5) is configured to switch on the second pair of light beamers (4*b*, 4*c*) in the second selection position.

Ex. 1001, 11:32–57; *see also* Pet. 16 (using same identifiers).

E. Asserted Grounds of Unpatentability

We instituted trial based on the following grounds of unpatentability, which are all the grounds of unpatentability raised in the Petition:

Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1	1–4, 8	103	Plassmann ¹ , Treuillet ² ,

¹ WO 2010/097572 A2, published Sept. 2, 2010 (Ex. 1007).

² Sylvie Treuillet et al., *Three-Dimensional Assessment of Skin Wounds Using a Standard Digital Camera*, IEEE Transactions on Medical Imaging, Vol. 28, No. 5 at 752 (2009) (Ex. 1016).

Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
			Staller ³
2	9–11	103	Plassmann, Treuillet, Staller, Peng ⁴

Pet. 5. The Petition and Reply are supported, for example, by declarations of Dr. Gerhardt Paul Otto, Ph.D. Exs. 1003, 1053. The Response and Sur-Reply are supported, for example, by declarations of Dr. Daniel van der Weide. Exs. 2006, 2013.

III. PATENT OWNER’S MOTION TO EXCLUDE

Patent Owner’s Motion to Exclude seeks to exclude two areas of evidence. We address each in turn.

A. *Exclusion of Dr. Otto’s Testimony to the Extent it Espouses and Relies on Inadmissible Hearsay*

Patent Owner argues that testimony of Petitioner’s witness, Dr. Otto, should be excluded to the extent Dr. Otto relies on statements regarding the depth of field of the MAVIS II system discussed in Treuillet because Treuillet’s statements are hearsay and not the kinds of fact an expert would reasonably rely upon. Mot. Excl. 1–12. Patent Owner further argues that Treuillet’s description of MAVIS II is inconsistent with Plassmann’s writings concerning MAVIS and should be excluded for this reason as well. *Id.* at 13–14.

Patent Owner’s argument for exclusion is unpersuasive for three reasons. First, as Petitioner argues in opposition to the motion to exclude, Treuillet is admissible as prior art. Opp. Mot. Excl. 2–3. Petitioner and Dr.

³ US 7,257,322 B2, issued Aug. 14, 2007 (Ex. 1006).

⁴ Qi Peng et al., *Automated 3D Scenes Reconstruction Using Multiple Stereo Pairs from Portable Four-Camera Photographic Measurement System*, International Journal of Optics, Vol. 2015 (2015).

Otto rely on Treuillet for what the Treuillet reference teaches to a person having ordinary skill in the art at the relevant time. Treuillet's suggestions to a person having ordinary skill in the art remain relevant even if Treuillet were factually incorrect in some respects.

Second, even if considered hearsay, Dr. Otto properly relied on Treuillet. Opp. Mot. Excl. 4–7. Under Federal Rule of Evidence 703, an expert may rely on facts and data that “need not be admissible,” including hearsay (double or otherwise). Here, the evidence supports that Treuillet was published in an independent, respected, and peer-reviewed IEEE journal. *Id.* at 5–6 (citing evidence regarding reliability of the IEEE journal). In addition, we find unavailing Patent Owner's arguments concerning “Reference 45.”⁵ Mot. Excl. 3–5; Reply Mot. Excl. 1–5. Rather, we find that it is appropriate for an expert also to rely on the sourcing in article published in such an IEEE journal. Thus, Treuillet is the kind of evidence we would expect an expert witness or person having ordinary skill in the art to rely upon, and Dr. Otto was entirely reasonable on relying on Treuillet in forming his opinions

Third, even if Treuillet were inconsistent with other evidence, such as Plassmann, this issue would go to the credibility of Dr. Otto's testimony and the weight given to it in deciding ultimate issues of fact rather than admissibility in the first instance.

For the reasons above, we deny Patent Owner's motion to exclude with respect to Dr. Otto's testimony.

⁵ Treuillet cited this reference as follows: “MAVIS II: 3-D wound instrument measurement Univ. Glamorgan, 2006 [Online]. Available: <http://www.imaging.research.glam.ac.uk/projects/wm/mavis/>.” Ex. 1016, 762.

B. *Exhibits 1018, 1019, 1026, 1028–1030, 1033, and 1034*

Patent Owner seeks to exclude Exhibits 1018, 1019, 1026, 1028–1030, 1033, and 1034 because “the Petition does not cite or otherwise rely on them.” Mot. Excl. 14–15. Petitioner argues that it relied on all of these exhibits aside from Exhibits 1018 and 1019.

In rendering our decision, we only consider Petitioner’s evidence to the extent it is properly presented in the Petition or the Reply. We consider Petitioner’s evidence that Dr. Otto cites only to the extent explanation of the evidence is properly presented in the Petition or the Reply or only for purposes of assessing whether Dr. Otto’s testimony presented in the Petition or the Reply is well-grounded. As such, resolution of Patent Owner’s motion to exclude with respect to these exhibits would not affect our decision making and is therefore moot.

For the reasons above, we dismiss as moot Patent Owner’s motion to exclude these exhibits.

IV. PATENT OWNER’S OBJECTIONS TO PETITIONER’S
DEMONSTRATIVES

Patent Owner objects to a number of Petitioner’s demonstratives for oral argument because, for example, the demonstratives constitute evidence that Petitioner did not reference or discuss in a prior paper. *See, e.g.*, Paper 58, 2. Patent Owner also objects to certain demonstratives as mischaracterizing the record. *Id.* at 1.

Demonstratives for oral argument are not evidence, and we do not rely on demonstratives as evidence in our decision making. Paper 45, 2 (Order Setting Oral Argument). Because demonstratives do not affect our decision making, Patent Owner’s objections to the demonstratives likewise do not affect our decision making and are therefore moot.

V. ANALYSIS

A. *Level of Ordinary Skill in the Art*

To determine whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). In assessing the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citing *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962–63 (Fed. Cir. 1986)). “[O]ne or more factors may predominate.” *Id.*

Petitioner argues that

[a] person of ordinary skill in the art (“POSITA”) would have had a working understanding of photography, stereophotogrammetry, and distance measuring in photography or stereophotogrammetry. Such an individual would have a master’s degree with a scientific focus on subjects such as optics and/or image processing, with at least about three years of experience in the field of photography, and stereophotogrammetry, as well as image processing in these fields, or an equivalent qualification.

Pet. 15 (citing Ex. 1003 ¶¶ 17–20).

Patent Owner argues that a person having ordinary skill in the art “would have a Bachelor’s degree in Physics or Electrical engineering or a similar field and two to three years of experience, including in image processing and computer graphics” and that Petitioner’s “assertion of a higher level . . . is incorrect.” PO Resp. 23.

The parties do not substantively address the differences in their proposed definitions for one of ordinary skill in the art. Pet. 15; PO Resp. 23; *see generally* Reply; PO Sur-reply. Moreover, the parties agree that which definition we adopt does not substantively impact our analysis of the parties' arguments concerning unpatentability. Tr. 29:19–30:9, 75:20–25.

Because Patent Owner's definition of the level of skill in the art is consistent with the '253 patent and the asserted prior art, we adopt it for purposes of this Final Written Decision. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *GPAC*, 57 F.3d at 1579; *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978). In addition, we do not find support in the record for requiring one of ordinary skill in the art to have had a master's degree. Pet. 15; Ex. 2013 ¶ 31 (testifying why a master's degree was unnecessary). Our analysis herein, however, does not turn on which of the parties' definitions we adopt.

B. Claim Construction

Because the Petition was filed after November 13, 2018, we apply the same claim construction standard that would be used in a civil action under 35 U.S.C. § 282(b), following the standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b) (2021). In applying such standard, claim terms are generally given their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art, at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. "In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence." *DePuy Spine, Inc. v.*

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Medtronic Sofamor Danek, Inc., 469 F.3d 1005, 1014 (Fed. Cir. 2006)
(citing *Phillips*, 415 F.3d at 1312–17).

Petitioner submits “that [no] express constructions are required for any terms.” Pet. 17. Patent Owner argues that the claim terms should have their plain and ordinary meaning. PO Sur-reply 1. The parties dispute, however, the scope of the plain and ordinary meaning of “two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views according to two different angles.” Thus, we address the parties’ dispute. *See Eon Corp. IP Holdings v. Silver Spring Networks*, 815 F.3d 1314, 1318 (Fed. Cir. 2016) (finding that disputes between the parties over the plain and ordinary meaning of a term need to be resolved as a matter of claim construction).

The gravamen of the parties’ dispute is what “different angles” refers to in the context of this limitation. According to Patent Owner, “different angles” refers to the orientation of the optical axis of each sub-optic. *E.g.*, PO Resp. 5–7. Specifically, Patent Owner argues that the limitation excludes configurations where the sub-optics’ optical axes are spaced in parallel, such as in a conventional stereophotogrammetry device, because the two views would be acquired at the same angle. *E.g., id.* In contrast, Petitioner argues that “different angles” refers to the sub-optics viewing a *subject* from different angles, such as when the sub-optics are spaced apart—parallel configurations are not excluded. *E.g.*, Pet. Reply 1.

We address in detail the parties’ arguments below, starting with the intrinsic evidence.

1. *Claim Language*

Patent Owner argues that “[t]he claim language does not mention light ‘from the subject’ or ‘object to be imaged,’ much less angles at which light

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is received from different points on a subject/object.” PO Resp. 19 (citing Ex. 2013 ¶ 101). “Rather, the ‘two different angles’ limitation defines an intrinsic characteristic of the sub-optics, *i.e.*, how they are ‘configured’” or angled, according to Patent Owner. *Id.* (citing Ex. 2013 ¶ 100).

We find this argument unavailing. Rather, we agree with Petitioner and determine that the claim language does not mean that the sub-optics are angled but instead means that they each view a subject from different angles. Ex. 1020, 11:43–45; Pet. Reply 7. Specifically, this limitation recites that the two sub-optics are “configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1020, 11:43–45. Notably, “according to two different angles” directly follows “two views,” rather than directly following “configured.” *Id.* And “view” means “[a] scene or an arrangement of subject material for a photograph,” according to a technical dictionary provided by Patent Owner. Ex. 2014,⁶ 210 (defining “view”). In other words, the term “view” itself refers to viewed subject material—a target subject.

We also find unavailing Patent Owner’s argument that “the ‘subject’ is claimed only in connection with the ‘positioning system (34)’ ‘configured to define . . . pre-defined point positions (A3, A4) of the target subject (S).” PO Resp. 19 (citing Ex. 1001, 11:36–40; Ex. 2013 ¶ 102). Again, the term “view” implicates the subject. Ex. 2014, 210.

We also find unavailing Patent Owner’s argument that the claims “disclose configuring the sub-optics according to ‘two different angles’ as a prerequisite to ‘pre-defining’ the ‘positions (A3, A4) of the target subject

⁶ Leslie Stroebe & Hollis N. Todd, *Dictionary of Contemporary Photography* (1974).

(S),’ as further claimed, and locating the subject at such positions within the two views.” PO Resp. 19–20 (citing Ex. 2013 ¶ 103); *see also id.* at 20 (arguing that dependent claims also support this argument). This argument is inapposite, and does not exclude parallel sub-optics. Rather, as Patent Owner acknowledges, conventional stereophotogrammetry devices can include parallel sub-optics “configured (spaced) to acquire two views,” and provide a stereoscopic binocular area where “the parallel views intersect to form stereo-pairs that can be reconstructed into three-dimensional representations.” PO Resp. 5–6; Ex. 2013 ¶ 67; Ex. 2015,⁷ 90. Hence, positions (A3, A4) can be predefined distances for the target subject S within that stereoscopic binocular area.

We likewise find unavailing Patent Owner’s argument that “the ‘two different angles’ limitation has nothing to do with the angles at which the sub-optics receive light from a subject but rather defines the space within which the subject must be located to be imaged in the first place.” *Id.* at 20 (citing Ex. 2013 ¶ 100); PO Sur-reply 2. This argument also is inapposite, and does not indicate that the claimed sub-optics’ axes are not in parallel, as Patent Owner argues. Rather, the space within which the subject must be located can be the stereoscopic binocular area. Ex. 2015, 90; PO Resp. 4.

We also find unavailing Patent Owner’s argument that because “[d]isplaced sub-optics may be configured to acquire two views at the same angle, or at ‘two different angles,’” “construing ‘two different angles’ to mean any displaced sub-optics would read the ‘two different angles’ limitation out of the claims.” PO Resp. 22 (citing Ex. 2013 ¶ 107); PO Sur-reply 5 (making same argument). Rather, we conclude that “according

⁷ Richard W. Kroon, *3D A-to-Z, An Encyclopedic Dictionary* (2012).

to two different angles,” in the context of the limitation, is needed to claim a stereophotogrammetry device. Put differently, we agree with Petitioner and conclude that claim 1 does not otherwise recite that the two sub-optics are spaced, such as in a conventional stereophotogrammetry device. Ex. 1001, 11:32–57; Pet. Reply 7 (citing Ex. 1053 ¶ 31).

Although the preamble for claim 1 recites “[a] device for stereophotogrammetry,” “[g]enerally, the preamble does not limit the claims.” Ex. 1001, 11:32–57; *Georgetown Rail Equip. Co. v. Holland L.P.*, 867 F.3d 1229, 1236 (Fed. Cir. 2017) (citation omitted). We also are persuaded by Petitioner’s argument that “the preamble here is not limiting, because the body of the claim provides a complete description of the device.” Pet. Reply 7 (citing *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997)). Hence, “two different angles” is not read out of the claim, but rather serves to claim a stereophotogrammetry device (e.g., by requiring spacing of the sub-optics).

Regardless, as Petitioner notes, no “canon of claim construction is absolute in its application and [] some surplusage may exist in some claims.” Pet. Reply 7 (quoting *Decisioning.com, Inc. v. Federated Dep’t Stores, Inc.*, 527 F.3d 1300, 1312 (Fed. Cir. 2008) (acknowledging that proper construction of “‘remote interface’ arguably renders the term ‘public’ in [a dependent claim] surplusage”)). And we view the phrase “configured for a simultaneous acquisition of two views according to two different angles” as referring to a stereophotogrammetry device, regardless if every word is needed to convey it.

In addition, we find unavailing Patent Owner’s argument that Petitioner makes new arguments concerning viewing the subject from different angles and the preamble not being limiting. PO Sur-reply 1 & n.1.

Simply put, these arguments from Petitioner involve issues related to claim construction regarding the scope of the plain and ordinary meaning of this limitation and which were raised by Patent Owner in its Response. Petitioner argument is, thus, allowable. *See Consolidated Trial Practice Guide* (November 2019)⁸ (“CTPG”), 45 (“The petitioner may respond to any such new claim construction issues raised by the patent owner.”).

2. *The '119 Patent Specification*

The parties each argue that the '119 patent Specification supports their arguments for the plain and ordinary meaning of this claim limitation. More specifically, Patent Owner argues that Figures 2–5 support that the sub-optics are oriented to have non-parallel (i.e., inwardly angled) optical axes. *See, e.g.*, PO Resp. 6. Patent Owner illustrates this position by annotating Figure 2 of the '119 patent. PO Resp. 17. We reproduce Patent Owner's annotated figure below.

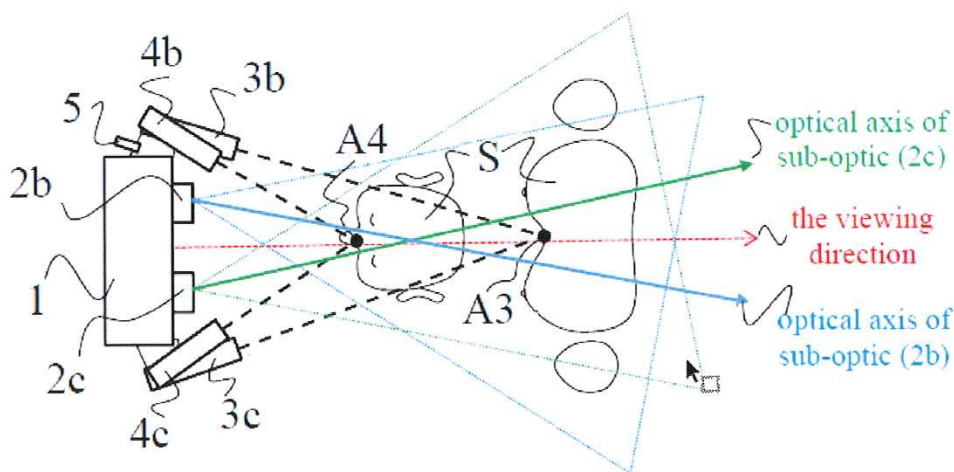


Figure 2 “represent[s] a possible implementation of the device viewed from the top.” Ex. 1001, 3:50–51. Patent Owner annotates Figure 2 by coloring

⁸ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

the pyramid extending from sub-optic 2b blue and coloring the pyramid extending from sub-optic 2c green. PO Resp. 17. Patent Owner also adds a solid blue arrow and a solid green arrow from each sub-optic to perpendicularly bisect the base of each pyramid, respectively. *Id.* Patent Owner labels each of these arrows as the “optical axis” of the respective sub-optic. *Id.* Patent Owner also adds a dotted arrow from the midpoint between the sub-optics through the centerpoint of an illustrated face and torso, and labels the arrow “the viewing direction.” *Id.*

We agree with Patent Owner that Figures 2–5 illustrate pyramid-shaped views acquired by the sub-optics where the pyramids are inwardly angled (rather than being perpendicular to the device’s plane). Ex. 1001, Figs. 2–5. But the Specification indicates that all of these figures illustrate *possible* or *exemplary* implementations. *See, e.g., id.* at 3:50–54 (stating that Figures 2 and 3 each illustrate a “possible implementation”); 9:26–30 (stating that Figure 4 is an “exemplary device”); 9:34–35 (stating that Figure 5 is an “exemplary device”). Thus, the Specification does not indicate that optical axes of the pyramids are essential to the invention; the Specification never even uses the term “optical axis.” To the contrary, the Specification provides that “[t]he double optics of the stereophotogrammetry device can be manufactured in different ways without impacting the functionality of the invention, provided that it is characterized by an increased depth of field.” *Id.* at 4:25–28.

Moreover, the Specification repeatedly refers to the different angles of the sub-optics relative to the viewed subject in a manner similar to the claims. *See, e.g.,* Ex. 1001, 4:7–14 (referring to “double optics enabling the acquisition of two simultaneous views with different angles *of the subject*”) (emphasis added), 4:20–31 (referring to “double optics” using “secondary

mirrors each receiving one image *of the subject* with a slightly different angle”) (emphasis added); Pet. Reply 3–5 (citing Ex. 1053 ¶¶ 19–29).

In addition, we find unavailing Patent Owner’s arguments concerning problems described in the Background section of the Specification and the advantages of the ’119 patent. PO Resp. 10–15. For example, the ’119 patent discloses that portable stereophotogrammetry devices previously developed included “a single, nominal distance for picture taking which is optimized either for the face or for breast, but not optimized for both applications at the same time,” according to Patent Owner. PO Resp. 9 (quoting Ex. 1001, 3:10–18; citing Ex. 2013 ¶ 73). Patent Owner argues that the ’119253 patent “ties the ‘two different angles’ limitation to overcoming the problem in the prior art and achieving the advantage of the invention” (i.e., a single stereophotogrammetry device for both distances). *Id.* at 10 (citing Ex. 1001, 3:28–31); *see also id.* (citing Ex. 1001, 4:25–29, 8:24–27; Ex. 2013 ¶ 76) (making same argument).

According to Patent Owner, however, if the sub-optics are configured for parallel views the field of view at point (A4) in Figure 2 “is too small to image the face and would not achieve the ‘advantage of the invention,’ *i.e.*, ‘a single portable stereophotogrammetry system . . . enabling the 3D reconstruction of the head . . . and . . . torso.’” *Id.* at 15 (quoting Ex. 1001, 8:8–15; citing Ex. 2013 ¶¶ 56, 87). This argument is unavailing. Rather, we agree with Petitioner and find that “[s]imply moving the subject further from the camera would place the face” within the view pyramids. *See* Pet. Reply 3–5; Ex. 1053 ¶ 29. As can be seen for the version of Figure 2 modified by Patent Owner to show parallel view pyramids, a sufficient field of view for the face and torso is within the binocular area if the subject is moved further from the camera. *See* PO Resp. 14 (modifying Ex. 1020, Fig. 2); *see also* Ex.

1053 ¶ 29 (testifying that moving further away “[i]f no other changes were made, . . . would slightly lower the 3D resolution of the surface captured by the device compared to using angled frustrums,” “[h]owever, in this application area a slight decrease in resolution is acceptable”).

In sum, we find that the ’119 Specification does not address optical axes and does not serve to limit the plain and ordinary meaning of this limitation so as to exclude parallel sub-optics.

3. *Prosecution History*

We now turn to the prosecution history the ’119 patent. The prosecution history “can often inform the meaning of the claim language by demonstrating how the inventor understood the invention.” *Phillips*, 415 F.3d at 1317. Such is the case here.

In particular, Patent Owner treated the “according to two different angles” language differently during prosecution than it does now. During prosecution, the Examiner rejected the challenged claims over Hoffmeier⁹ and concluded that Hoffmeier disclosed a stereophotogrammetry device comprising “two sub-optics (2b) and (2c) configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1002, 63–66; Ex. 1053 ¶ 12; Pet. Reply 1–3. Hoffman’s Figure 3 depicts its device and illustrates two views of its subject in Figure 4. Ex. 1005 ¶¶ 25–26; Ex. 1053 ¶ 13. We reproduce these two figures side by side below.

⁹ US 2011/0175987 A1, published July 21, 2011 (Ex. 1005)

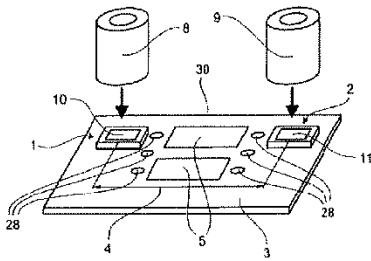


FIG. 3

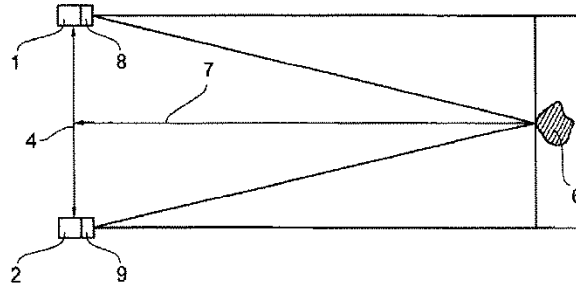


FIG. 4

Ex. 1005, Figs. 3–4. Hoffman’s Figure 3 is a perspective view of the Hoffman system. *Id.* ¶ 25. Hoffman’s Figure 4 “shows a schematic structure of a stereo camera system with the Hoffman stereo camera system board.” *Id.* ¶¶ 10, 26. The evidence supports that Hoffman’s lenses face forward rather than at an angle. *Id.* at Figs. 3–4, ¶ 37 (“The two optical systems 8, 9 can be coupled to the board 3 such that the respective optical axis of an optical system 8, 9 runs through the center point of the image sensing area 10, 11 of an image detection sensor 1, 2”); *see also* Ex. 1053 ¶ 14 (Petitioner’s expert opining that Hoffmeier’s Figure 4 “shows components 8 and 9 as having parallel axes”).

During prosecution, Patent Owner submitted of a statement of its CEO and ’119 patent inventor, Jean-Philippe Thirion, responding to the rejection. Ex. 1002, 88–107; Ex. 2019 ¶ 8. Importantly, in that submission, Patent Owner admitted that Hoffmeier teaches claim 1’s “two different angles” recitation as follows:

Being devoid of any positioning system external to the stereovision system itself makes Hoffmeier quite different from the invention described in ’981 [(referencing the ’981 application that led to the ’119 patent)]. Hoffmeier therefore discloses “A device for stereophotogrammetry comprising a camera body (1) and a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views

according to two different angles” as in claim 1 of ’981, but it is all that Hoffmeier discloses relative to claim 1 of ’981.

Ex. 1002, 92 (bold emphasis added). Patent Owner further admitted that “8 and 9 in FIG 3 of Hoffmeier exactly correspond to 2b and 2c in FIG 2 of [the ’119 patent].” *Id.* at 91–92.

Patent Owner’s admissions during prosecution suggest to the public that Patent Owner understood that spaced optics with parallel optical axes may, nonetheless, fall within the scope of claim 1. Patent Owner now downplays these admissions by arguing that Hoffmeier “is ambiguous as to whether the optical axes of 8, 9 are angled inwards, or are parallel.” PO Sur-reply 8. Although we agree Hoffmeier is ambiguous in this regard, the ambiguity does not help Patent Owner’s position. Rather, despite ambiguity, Patent Owner admitted that Hoffmeier taught “two views according to two different angles.” Ex. 1002, 92. The prosecution history, thus, suggests that Hoffmeier’s optical axes orientation is not important to whether the “two different angles” recitation is met. As such, Patent Owner’s prosecution history statement aligns with the present arguments of Petitioner, not Patent Owner.

4. *Parallel Litigation*

During district court litigation involving the ’119 patent, Patent Owner responded to Petitioner’s invalidity allegations regarding the Plassmann reference by agreeing that Plassmann teaches the now disputed “according to two different angles language”:

QuantifiCare agrees that the quoted language and figure include, *inter alia*, a double-optics comprising two sub-optics configured for a simultaneous acquisition of two views according to two different angles.

Ex. 1037, 2; *see also* Pet. Reply 6.

Patent Owner now disputes that Plassmann teaches this recitation. *See, e.g.*, PO Resp. 27–30 (arguing that Petitioner’s contention that Plassmann acquires “two views according to two different angles” is incorrect). Thus, Patent Owner’s position in the district court litigation was consistent with its position during prosecution but inconsistent with its position in the current proceeding.¹⁰ Thus, this inconsistency at least somewhat weighs against Patent Owner’s arguments.

In addition, we find unavailing Patent Owner’s argument that its agreement was subject to an objection that Petitioner failed to identify specifically where in Plassmann the limitation was taught. PO Sur-reply 8 (Ex. 1037, 2). Rather, Petitioner identified Plassmann’s Figure 1B and a passage describing it, which is the same structure Petitioner relies on here. Ex. 1037, 2.

In addition, we find unavailing Patent Owner’s argument that this issue was raised belatedly by Petitioner. PO Sur-reply 8. As we discuss above, Petitioner may make this argument because it is responsive to issues of claim construction Patent Owner raises in its Response. CTPG, 45.

5. *Summary*

In view of the record as a whole, the weight of the evidence supports that claim 1’s “two views according to two different angles” language does not require that the optical axis of each sub-optic be angled differently but

¹⁰ Patent Owner argues that this extrinsic evidence should be disregarded. PO Sur-reply 8–9. We disagree. While the extrinsic evidence is entitled to less weight, it nonetheless bolsters the intrinsic evidence establishing that Patent Owner—outside of the instant proceeding—understood “two views according to two different angles” in accordance with Petitioner’s claim construction.

instead requires only that the sub-optics view the subject from different angles. Put differently, we conclude that this disputed limitation covers configurations of the two sub-optics that are spaced, regardless of whether the sub-optics' optical axes are orientated in parallel.

C. Principles of Law

“In an [inter partes review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring inter partes review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

A claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time of the invention to a person having ordinary skill in the art. *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of non-obviousness, if present. *See Graham*, 383 U.S. at 17–18. When evaluating a claim for obviousness, we also must “determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

D. Objective Indicia of Non-Obviousness

Patent Owner argues that considerations of “commercial success, copying, long-felt need, and praise for the invention, further demonstrate non[-]obviousness.” PO Resp. 55–67.

Objective indicia of nonobviousness may include long-felt but unsolved need, failure of others, unexpected results, commercial success, copying, licensing, industry praise, and expert skepticism. *Mintz v. Dietz & Watson, Inc.*, 679 F.3d 1372, 1379 (Fed. Cir. 2012). Objective indicia are only relevant to the obviousness inquiry if there is a nexus between the claimed invention and the objective indicia of nonobviousness. *In re Affinity Labs of Tex., LLC*, 856 F.3d 883, 901 (Fed. Cir. 2017). A rebuttable presumption of nexus applies only “when [a patent owner] shows that the asserted objective evidence is tied to a specific product and that product ‘embodies the claimed features, and is coextensive with [the claims].’” *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (quoting *Polaris Indus. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1072 (Fed. Cir. 2018)). On the other hand, a patent owner is not entitled to a presumption of nexus if the patented invention is only a component of a commercially successful machine or process. *Id.* (reaffirming the importance of the “coextensiveness” requirement).

Applying *Fox Factory*, the Board uses a two-step analysis in evaluating nexus between the claimed invention and objective evidence of nonobviousness, also referred to as secondary considerations. *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 33 at 33 (PTAB Jan. 24, 2020) (precedential). We first consider whether Patent Owner has demonstrated “that its products are coextensive (or nearly coextensive) with the challenged claims,” resulting in a rebuttable presumption of nexus. *Id.* at 33. If not, that

“does not end the inquiry into secondary considerations”; “the patent owner is still afforded an opportunity to prove nexus by showing that the evidence of secondary considerations is the ‘direct result of the unique characteristics of the claimed invention.’” *Id.* (quoting *Fox Factory*, 944 F.3d at 1373–75). For the reasons discussed below, we find that Patent Owner does not demonstrate (i) that its products are coextensive with the challenged claims for a presumption to attach, and (ii) the requisite nexus with evidence that the secondary considerations are the direct result of the unique characteristics of the claimed invention.

1. Presumption of Nexus

Patent Owner argues that “its LifeViz Infinity (‘Infinity’) product is disclosed and claimed in the patent.” PO Resp. 55 (citing Ex. 2013 ¶ 213). Patent Owner argues that Petitioner “does not dispute this assertion.” *Id.* (citing Pet. 72). Patent Owner thus states that, “Therefore, nexus of secondary considerations regarding the Infinity to the invention is presumed.” *Id.* (citing *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1330 (Fed. Cir. 2016)).

We disagree. Patent Owner does not provide an analysis demonstrating that its Infinity product is coextensive (or nearly coextensive) with the challenged claims. Rather, Patent Owner cites to the following testimony of Dr. van der Weide: “I have reviewed the LifeViz Infinity device and conclude that it embodies the invention of the [’]253 Patent. More specifically, the Infinity possesses all the features listed in claim 1 of the patent.” *Id.* (citing Ex. 2013 ¶ 213). Simply put, Patent Owner fails to provide any analysis whatsoever. *Id.*; see also 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”).

Moreover, Patent Owner's reliance on *WBIP* is misplaced. In that decision, "WBIP presented evidence that specific products . . . [we]re embodiments of the invention as claimed in the asserted claims," and that provided a basis for finding a presumption of nexus. *WBIP*, 829 F.3d at 1329–31. Such is not the case here.

In sum, Patent Owner does not provide the required analysis demonstrating that Infinity is coextensive (or nearly coextensive) with the challenged claims. PO Resp. 55; *Lectrosonics*, Paper 33 at 33. We, therefore, find that a presumption of nexus is inappropriate.

2. Direct Result of the Unique Characteristics of the Claims

For the second step of our analysis, we look to whether Patent Owner demonstrates the requisite nexus with evidence that any secondary considerations are the direct result of the unique characteristics of the claimed invention. In particular, we address below Patent Owner's arguments directed to the secondary considerations of (i) commercial success, (ii) copying, (iii) long-felt need, and (iv) praise for the invention. PO Resp. 55–67.

a) Commercial Success

For the commercial success indicia to support nonobviousness, Patent Owner needs "to show both commercial success and that a nexus exists between that success and the merits of the claimed invention." *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1350 (Fed. Cir. 2012). We start with the latter of these requirements and look to Patent Owner's arguments that a nexus exists between the purported commercial success and the challenged claims.

First, Patent Owner argues that "[a] nexus between sales of Infinity and the claimed invention is presumed because Infinity 'is the invention

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disclosed and claimed in the patent.” PO Resp. 61 (citing *WBIP*, 829 F.3d at 1330). We find this argument unavailing because as we find above, Patent Owner does not demonstrate that a presumption should attach. *See supra* Section (V)(A).

We also find unavailing Patent Owner’s argument that “customers have identified claimed features as important to their use of the invention.” PO Resp. 61 (citing PO Resp. 59–60 (arguing that the claimed invention has received praise)). This argument does not address whether any sales, for example, of the Infinity product were owed to the merits of the claimed invention, nor that such purported praise lead to actual demand.

We also find unavailing Patent Owner’s argument that “Infinity sales were due to claimed features of the invention, *e.g.*, its ‘dual-distance’ functionality, which permitted customers to avoid buying multiple products or a non-portable multi-head system to accomplish the same tasks – as was noted by the EuroMediCom press release.” PO Resp. 62 (citing Ex. 2020,¹¹ 4). The announcement identifies the Infinity product as “BEST AESTHETIC DEVICE,” and describes the product, but does not evidence any specific demand for, or sales of, the Infinity product due to any features of the challenged claims. *See* Ex. 2020, 4. Nor does Patent Owner sufficiently address whether dual-distance functionality comprises the unique characteristics of the claimed invention.

We also find unavailing Patent Owner’s argument that “[t]he primary functional difference between [Petitioner’s] H2 and H1 [products] is that H2 can image the body (at a different distance) in addition to the face,” and that

¹¹ *Winners 2018-2019*, EuroMediCom (Jan. 29, 2021) <https://www.euromedicom.com/mca-2018/en/trophy/Winners-2018-2019.html>.

“[i]t follows that the large differential in production of the H2 as compared to H1 is due to that additional functionality.” PO Resp. 62 (citing Ex. 2034¹² (arguing that Vectra H1 images face only); Ex. 2030¹³ (arguing that Vectra H2 captures a face or body image). Patent Owner provides no evidence for why this purported differential in production occurred; rather, Patent Owner speculates.

Second, we do not find that Patent Owner demonstrates commercial success of the Infinity product. To establish commercial success, Patent Owner relies on a declaration from its CEO, Dr. Thirion. PO Resp. 61–64 (citing Ex. 2019 ¶¶ 29–37). Although Dr. Thirion provides evidence of increasing sales of Infinity, Dr. Thirion does not give any specific information about unit sales, revenue, or the Infinity’s market share relative to the greater medical imaging market. Ex. 2019 ¶¶ 29–37.

In addition, we find unavailing Patent Owner’s argument that Petitioner “does not contest that its H2 infringes, and thus its sales are relevant to the invention’s commercial success.” PO Sur-reply 25 (citing *Truswal Sys. Corp. v. Hydro-Air Eng’g, Inc.*, 813 F.2d 1207, 1215 (Fed. Cir. 1987) & n. 12 (citing Ex. 2013 ¶¶ 215–219). We find insufficient support for Patent Owner’s assertion that Petitioner does not contest infringement. And we find Patent Owner’s reliance on *Truswal* misplaced. First, we note that Patent Owner cites to Judge Rich’s dissent in *Truswal*. Second, Judge Rich stated the “once an infringer is sued *and proved to be an infringer*, its sales are appropriately proved and added to the others,” and that “[i]t is necessary to establish that the alleged copies are actual infringements of the patent in

¹² *Vectra H1 Quick Reference Guide*, Canfield (2014).

¹³ *Vectra H2: Capturing a FACE or BODY image*, Canfield.

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suit before they can possibly be relevant and counted as successes *of the patented invention.*” *Truswal*, 813 F.2d at 1215 (Rich, J., dissenting).
Petitioner, as of now, has not been proved to infringe.

In sum, we find that Patent Owner does not show sufficient nexus between the purported commercial success and the claimed invention and fails to show commercial success.

b) Copying

Patent Owner alleges that Petitioner’s Vectra H2 “is a copy of *the invention*, in structure, function, operation, and use.” PO Resp. 64–66 (emphasis added). Patent Owner argues that Petitioner’s the Vectra H2 mimics patented features and Infinity’s use of red and green light beamers. *Id.* at 64. Patent Owner emphasizes that Petitioner launched its H2 device “[e]ighteen months after Quantificare launched its Infinity.” *Id.* Based on these allegations, is unclear whether Patent Owner alleges that Petitioner copied Patent Owner’s patent disclosure, subject matter of Patent Owner’s patent claims, or Patent Owner’s Infinity device.

Petitioner argues that it did not copy Patent Owner’s invention and identifies technical distinctions between the parties’ products. Reply 29–30. Petitioner’s witness, Dr. Otto, credibly opines that Petitioner’s choice of red and green light beamers was made for functional reasons (it is easier to get bright LEDs in red and green than in other colors). *Id.* at 30 (citing Ex. 1053 ¶¶ 80, 81).

Here, Patent Owner lacks evidence that Petitioner copied the ’119 patent or any claim of the ’119 patent. Patent Owner has no evidence, for example, that Petitioner was aware of the ’119 patent during development of the H2 device. Patent Owner further lacks evidence that any particular aspect of the ’119 patent was copied. *In re GPAC Inc.*, 57 F.3d 1573, 1580

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(Fed. Cir. 1995) (“more than the mere fact of copying by an accused infringer is needed to make that action significant to a determination of the obviousness issue”) (citation omitted).

Patent Owner also lacks evidence that Petitioner copied any patented product. As we explain above, Patent Owner lacks evidence that the Infinity is coextensive or nearly coextensive with any challenged claim; the record, thus, does not establish that Infinity is a “patented product” in a relevant sense.

Moreover, our reviewing court has held that “copying requires evidence of efforts to replicate a specific product, which may be demonstrated through internal company documents, direct evidence such as disassembling a patented prototype, photographing its features, and using the photograph as a blueprint to build a replica, or access to the patented product combined with substantial similarity to the patented product.” *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010). Here, Patent Owner lacks evidence that Petitioner studied any Patent Owner product or documents when developing the H2 device. Just to the contrary, the preponderance of the evidence supports that Petitioner’s H2 product differs from Patent Owner’s product because it refocuses at different distances (a design present in prior art systems). Ex. 1053 ¶¶ 79–81; *see also* Reply 29.

Thus, based on the record as a whole, Patent Owner’s allegation of copying is unpersuasive and does not support non-obviousness.

c) Long-Felt Need

Patent Owner argues that there was a long-felt need which the invention of the ’253 patent addresses. PO Resp. 55–59; PO Sur-reply 26. First, Patent Owner argues that in 2007, it “developed and launched the LifeViz stereophotogrammetry camera,” which “was a portable, handheld,

single camera device with one pair of beamers converging at the focus distance of the camera, and subjects were imaged at that distance.” PO Resp. 57 (citing Ex. 2019 ¶¶ 9–12).

Second, Patent Owner argues that “[a]t the time of invention [of the ’253 patent], there were no portable, ‘all-in-one’ handheld stereophotogrammetry devices for imaging both face and breast/torso.” *Id.* at 58 (citing Ex. 2019 ¶¶ 25–26, 29). “To image both, practitioners had to purchase one device for face and one for breast/torso, or purchase the large, costly multi-head Canfield XT,” which had disadvantages, according to Patent Owner. *Id.* (citing Ex. 2019 ¶¶ 25–26, 29; Ex. 1001, 1:49–52).

Patent Owner argues that “[a]ccordingly, since at least the 2007 introduction of LifeViz, there was a long-felt need for a portable single-camera stereophotogrammetry device that avoided the disadvantages of purchasing multiple devices or a multi-head device like the Canfield XT.” *Id.* at 58–59 (footnote omitted) (citing Ex. 2013 ¶ 212; Ex. 2019 ¶ 30; Ex. 2020, 4). “To address that deficiency, [Patent Owner] developed Infinity in 2015, filed for a patent thereon on October 14, 2015, and began commercial sales one year later,” according to Patent Owner. *Id.* at 59 (citing Ex. 2019 ¶¶ 28–29). Patent Owner argues that its Infinity product satisfied the long-felt need as demonstrated by industry praise and commercial success. *Id.* (citing Ex. 2019 ¶ 30; Ex. 2020, 4). Patent Owner also cites for support Dr. Otto’s deposition testimony that “it ‘was desired to do breast imaging,’ there was ‘a big demand’ to image ‘both areas,[]’ and [Petitioner] ‘didn’t want to have a separate product to do breast imaging.’” PO Sur-reply 26 (citing Ex. 2037, 17:22–18:17).

We find that Patent Owner does not show that there was a long-felt need that the claimed invention addresses. “[L]ong-felt need is analyzed as

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of the date of an articulated identified problem and evidence of efforts to solve that problem.” *Texas Instruments Inc. v. U.S. Int’l Trade Comm’n*, 988 F.2d 1165, 1178 (Fed. Cir. 1993). Patent Owner does not show that the LifeViz product having only one pair of beamers converging at one distance was identified as a problem needing solution in 2007. *See* Ex. 2019 ¶¶ 9–12. Rather, Dr. Thirion testifies to the capabilities of the 2007 LifeViz product. *Id.* That a later generation product, such as Infinity, has additional capabilities does not evidence that a long-felt need existed and was met. Rather, evidence must be provided that shows there was an articulated identified problem and efforts to solve that problem, which Patent Owner does not do. Nor does Patent Owner provide evidence that Infinity was met with skepticism or that persons of ordinary skill in the art tried and failed to achieve the claimed invention.

Nor are we persuaded that industry praise and commercial success alone is sufficient to evidence a long-felt need that the claimed invention addresses. Both can exist without a long-felt need having existed. *See* Ex. 2019 ¶ 30 (testifying that Infinity created a new market for sales, but not providing direct evidence that a long-felt need had existed in the industry); Ex. 2020, 4 (stating that Infinity “is the first portable 3D imaging system capable of capturing face, body, and breast areas thanks to two sets of dual beamer pointers which allow for two distance settings,” but without stating it met a long-felt need). Furthermore, Dr. Otto’s deposition testimony cited by Patent Owner does not evidence that there was a long-felt need that the claimed invention solved. Ex. 2037, 17:22–18:17.

In sum, we find that Patent Owner does not show that there was a long-felt need. Moreover, Patent Owner does not provide analysis to show

the requisite nexus between the purported long-felt need and the unique characteristics of the claimed invention.

d) Praise

Patent Owner argues that Infinity won a prestigious award, the 2018 EuroMediCom Best Aesthetic Device Award, and that this award establishes industry praise. PO Resp. 59–60. In addition, Patent Owner argues that this award has nexus with the invention. *Id.* To that end, Patent Owner quotes three portions of the EuroMediCom announcement, and argues that “[t]his praise is squarely directed to the claimed invention.” *Id.* at 59–60 (citing Ex. 2020, 4; Ex. 2013 ¶ 214).

Below we produce the entirety of the announcement, and we italicize the portions Patent Owner quotes in its Response.

The LifeViz® Infinity is the first portable 3D imaging system capable of capturing face, body, and breast areas thanks to two sets of dual beamer pointers which allow for two distance settings. This unique system has two acquisition modes. A tripod mounted camera and turntable quickly capture a 360° 3D body image. Eight images are automatically taken and seamlessly stitched to produce a “life-like[”] 3D image of the body for visualization by the physician and patient. In hand-held mode, the camera is capable of generating 3D images of face and breast to simulate procedures and photo-document before/after interventions, without blocking an entire exam room with cumbersome equipment.

With a simple flip of a switch, dual beam pointers adjust to the distance ideal for face or body applications without the need for cumbersome repositioning and/or multi-headed systems. Superior image quality has been achieved by improving the optic performance. The LifeViz® Infinity produces excellent pictures from both near and far thanks to an increased deep field of view. Finally, a powerful external flash removes the need for specific lighting conditions and additional equipment ensuring reproducible images from one session to the next. The LifeViz® Infinity is comprised of a portable stereovision camera, a

software suite including an image database, 3D viewer tool, 3D skin analysis, face, breast, and body measurements and simulation modules. All aspects of 3D documentation, comparison, simulation, and measurement ranging from medical to cosmetic applications are possible with this single unique device.

Ex. 2020, 4 (*italics emphases added*). As can be seen above, the announcement broadly describes the Infinity product, including many additional features that Patent Owner does not identify, such as “a tripod mounted camera and turntable”; “[e]ight images are automatically taken and seamlessly stitched to produce a ‘life-like’ 3D image of the body for visualization”; “a powerful external flash”; and “a software suite including an image database, 3D viewer tool, 3D skin analysis, face, breast, and body measurements and simulation modules.” *Id.*

Patent Owner does not show that the purported praise is a direct result of the unique characteristics of the claimed invention. The announcement touts additional features of Patent Owner’s product. Based on the announcement, we cannot assess whether praise for Patent Owner’s product is grounded in a claimed feature, other features, or a combination thereof. Patent Owner does not directly compare the announcement with the challenged claims and does not clearly identify what Patent Owner contends are the unique characteristics of the claimed invention being praised. Moreover, the challenged claims are of varying scope, and Patent Owner does not address those differences.

In addition, Patent Owner argues that three “medical professionals’ praise is directed to the claimed invention.” PO Resp. 60–61 (citing

Ex. 2021,¹⁴ 11, 19–20). In particular, Patent Owner quotes from Dr. Lee’s testimonial that “[a]lthough regular 2D pictures are inconvenient, capturing a face or body in 3D with the 3D LifeViz® Infinity is easier. First of all, you have a unique device for standardized photography with a switch that adjusts the ideal distance for face and body.” *Id.* at 60 (citing Ex. 2021, 19). Patent Owner does not relate this portion of Dr. Lee’s testimonial to the claims, including failing to show that the purported praise is a direct result of the unique characteristics of the claimed invention.

In addition, Patent Owner quotes from the testimonial of Dr. Karimi who states that Infinity is “a state of the art, easy to use photographic system that has become an essential part of our consultation for face and body procedures.” *Id.* at 61 (citing Ex. 2021, 20). And Patent Owner argues that “Dr. Myriam Fopp uses LV Infinity for face (‘Wrinkles, Pores’) and body,” and Dr. Fopp states that “[w]e also use our LifeViz® Infinity technology for body treatments.” *Id.* (citing Ex. 2021, 11). As above, Patent Owner does not relate these portions of Drs. Karimi’s and Fopp’s testimonials to the claims, including failing to show that the purported praise is a direct result of the unique characteristics of the claimed invention.

In sum, we find that Patent Owner does not show sufficient nexus between the purported praise and the claimed invention.

E. Ground One: Obviousness Based on Plassmann, Treuillet, and Staller

Petitioner asserts that the ’119 patent’s claims 1–4 and 8 would have been obvious over Plassmann, Treuillet, and Staller. Pet. 29–58. We provide

¹⁴ *Testimonials: What our customers say*, QuantifiCare
<https://www.quantificare.com/learn/testimonials/>.

an overview of Plassmann, Treuillet, and Staller before we address this ground.

1. *Plassmann (Ex. 1007)*

Plassmann is a World Intellectual Property Organization publication that relates to an apparatus for the production of stereoscopic images. Ex. 1007, at codes (10), (19), (57). Plassmann describes variations of the “MAVIS” system. *Id.* at 12:25–5. Plassmann’s apparatus captures “two images [which are] needed to form a stereo image . . . to produce a three-dimensional representation of the subject.” *Id.* at 12:25–29. The apparatus further includes two light emitting diodes (LEDs) emitting respective beams which converge at a particular distance in front of the apparatus. *Id.* at 12:7–13.

Below, we reproduce Plassmann Figures 1A and 1B.

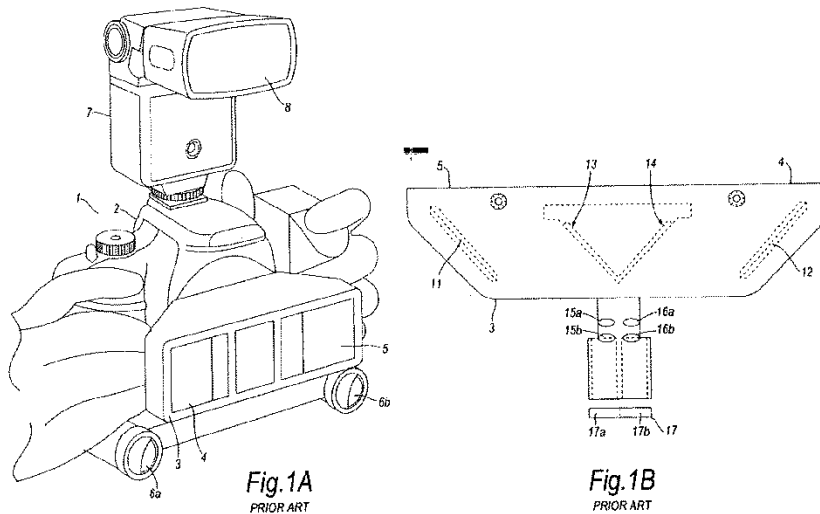


Figure 1A is a perspective representation of an apparatus for obtaining stereoscopic images, showing body 2, e.g., a camera, and adaptor 3. *Id.* at 11:3–4, 11:28–12:4. Further Figure 1B shows a “plan view” of adaptor 3 in further detail. *Id.* at 11:5–6, 12:13–14. Adaptor 3 has two apertures 4, 5

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which respectively collect light which is respectively focused onto charge coupled device parts 17a, 17b, forming respective first and second images. *Id.* at 12:15–25. The first and second images form a stereo image used to produce a three-dimensional representation of a subject. *Id.* at 12:25–29.

Additionally, as shown in Figure 1A, the apparatus includes

two low-powered light emitting diodes (LEDs) 6a, 6b, each provided with a [focusing] lens to produce a beam of light and being arranged so that the beams converge and meet at a point a fixed and desired distance from the apparatus, this distance corresponding to the distance at which the camera lens is [focused].

Id. at 12:8–13. The converging beams act as “a guide to show distance between the apparatus and subject.” *Id.* at 16:12–14.

2. *Treuillet (Ex. 1016)*

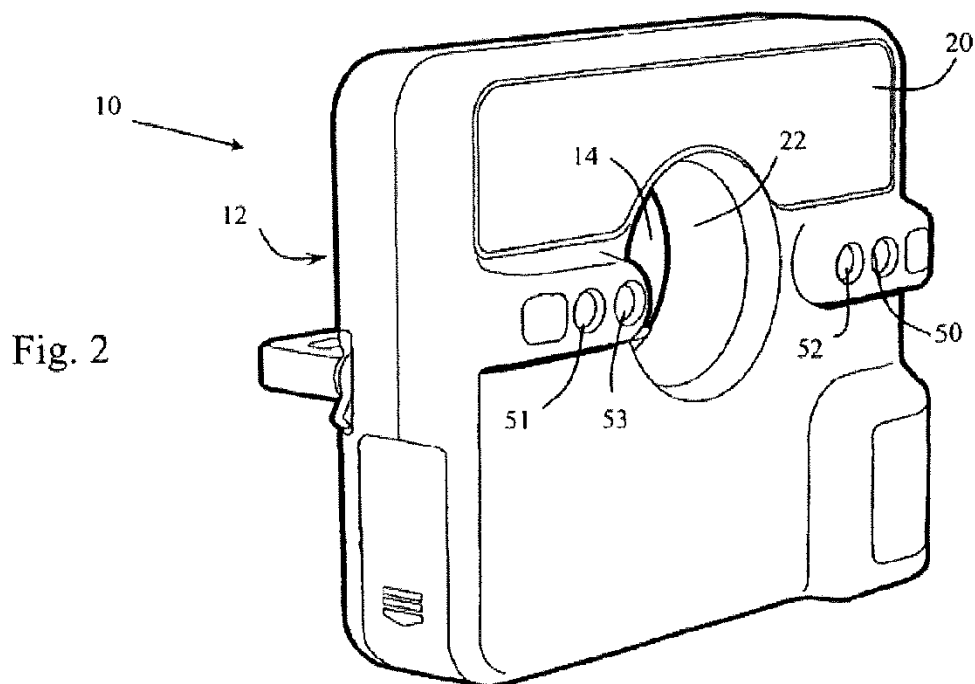
Treuillet is a paper that relates to an “approach to build 3-D models of skin wounds from color images.” Ex. 1016, 752. Treuillet explains that “[b]y taking two color images from different points of view, stereophotogrammetry allows the computation of the 3-D coordinates of numerous points on the skin lesion.” *Id.* at 754.

By way of imaging technology background, Treuillet describes the MAVIS II system as “a reflex digital camera equipped with special dual lens optics for recording two images from slightly different viewpoints, generating a stereo pair” which includes “two tube-shaped projectors produce beams of light which intersect in a single spot when the camera is held at the right distance” at “about 80 cm from the wound,” with a tolerance of plus or minus 15 cm. *Id.* at 755.

3. *Staller (Ex. 1006)*

Staller is a United States patent that relates to a diffuser attachment for a camera including a “distance measurement device [that] uses a pair of light beams which intersect at a repeatable distance from the diffuser body to readily enable positioning of an object to be photographed at that repeatable distance.” Ex. 1006, codes (10), (12), (57).

Below, we reproduce Figure 2, which shows a front perspective view of a diffuser. *Id.* at 3:13–14.



As shown in Figure 2, the diffuser “includes a distance measurement device or indicator in the form of a plurality of light beam emitters 50–53.” *Id.* at 5:13–15. “Each pair of emitters 50–51, 52–53 creates a pair of angled light beams which intersect at different distances in front of diffuser body 12.” *Id.* at 5:17–18. As such, “[e]ach of the pairs of light beams allows diffuser 10 to be relocated at the same repeatable 20 distance from a subject.” *Id.* at 5:18–

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21; *see id.* at Fig. 4. That is, each pair of emitters indicates a different distance. *Id.* at 2:30–35; *see id.* at 5:64–6:2.

Further, either of the emitter pairs, i.e., pair 50–51 or pair 52–53, are selected using a selector switch. *Id.* at 5:38–41. By selecting a particular emitter pair, the distance measurement device indicates a particular distance measurement. *See id.*

4. Discussion

Because Petitioner’s ground requires combining the teachings of Plassmann, Treuillet, and Staller (Pet. 5), we first address motivation to combine. *See KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring “articulated reasoning with some rational underpinning to support the legal conclusion as to obviousness”)). We then address the recitations of each claim that this ground addresses.

a) Reason to Combine

Petitioner relies on Plassmann as teaching most of claim 1’s recitations. For example, Plassmann teaches a stereoscopic adaptor and teaches one pair of light beamers producing intersecting light beams to position a subject within Plassmann’s depth of field. Pet. 17, 34–36; Ex. 1003, Figs. 6a, 6b, ¶ 111. Petitioner does not allege that Plassmann, by itself, discloses claim 1’s recitations regarding two pairs of light beamers converging on two different point positions.

To explain why the two pairs of light beamers recitations nonetheless would have been obvious, Petitioner relies on Treuillet and Staller. Petitioner’s declarant, Dr. Paul Otto, testifies that a person of skill in the art would have understood that the Plassmann device “has a depth of field which contains many distances at which ‘the camera lens is focused.’”

Ex. 1003 ¶ 113. Petitioner relies on Treuillet to confirm that Plassmann was capable of an expanded depth of field. Pet. 36; Ex. 1003 ¶ 113.

Petitioner persuasively argues that Treuillet teaches that the Plassmann MAVIS II device may take acceptable wound photographs from 65 centimeters to 95 centimeters (within its “depth of field”). Pet. 36; Ex. 1003 ¶ 113; Ex. 1016, 755. A person of skill in the art would have understood that acceptable medical wound photographs would have to be adequately focused and that Treuillet, therefore, suggests a depth of field from 65 centimeters to 95 centimeters for the Plassmann device. Ex. 1003 ¶ 113 (explaining that a person of skill in the art would understand that Plassmann has an expanded depth of field because it can “accurately image a subject at multiple positions”).

Petitioner then relies on Staller as teaching multiple light beamers to define more than one imaging position within a depth of field. Pet. 41–42; Ex. 1006, Fig. 4, 2:29–34, 5:56–6:2. Staller teaches plurality of pairs of light beams that “intersect at a different repeatable distance from the diffuser body.” Pet. 23; Ex. 1006, code (57), 2:29–32, 5:13–15; *see also id.* at 5:56–6:2 (“[T]wo pairs of light beam emitters . . . may be used to provide three or four separate pairs of intersecting bea[m]s and three or four corresponding repeatable distances for diffuser 10.”). In other words, Staller teaches having at least two distinct predefined distance positions for the camera. Ex. 1006, code (57), 2:29–32, 5:13–15, 5:56–6:2. The advantage of the plurality of pairs of light beams is taught by Staller: repeatability. Ex. 1006, 6:10–15 (referring a concern for “repeatable scale” to “improve[] the usefulness of close range photographs for medical” applications).

Petitioner persuasively argues that a person of skill in the art would have been motivated to predefine two distances from a device in order to

provide for varying levels of magnification. Pet. 45–46. Petitioner persuasively explains that a person of skill in the art would have had a reasonable expectation of success in combining the references’ teachings. *Id.* at 46–47.

Patent Owner argues that a person of ordinary skill in the art would not have “add[ed] beamers converging where Plassmann’s camera is less than optimally focused so as to purposely obtain images of degraded focus and quality.” PO Resp. 31 (citing Ex. 2013 ¶¶ 142, 154–155). Patent Owner first argues that image focus is critical to patient treatment and that a person of skill in the art would understand that a person using Plassmann would want high image quality. *Id.* at 31–33. Patent Owner then argues that, in view of the criticality of image sharpness to wound measurement, a person having ordinary skill in the art would not modify Plassmann to “image at a distance of degraded focus.” *Id.* at 34 (emphasis omitted); *see also* PO Sur-reply 17–20 (making similar arguments that optimal focus to ensure precision and accuracy of the image of a wound).¹⁵ Patent Owner emphasizes that Plassmann refers to “*the* distance at which the camera lens is focused” and that this is a singular distance of optimal focus. *Id.* at 35

¹⁵ Patent Owner refers to Exhibits 2039 and 2040 in its Sur-reply. Patent Owner used these exhibits (which Petitioner served on Patent Owner, but did not file in this proceeding) during a deposition of Dr. Otto, and filed them in this proceeding with its Sur-reply, which is late under our Rules. *See* Paper 41 (Order), 3 (authorizing refiling of exhibits to correct numbering, but stating that “this order does not address the merits of whether or not the exhibits at issue are proper”). We consider these exhibits in evaluating Dr. Otto’s testimony, but “not as evidence supporting [Patent Owner’s] arguments on the merits.” *Ascend Performance Materials Operations LLC, v. Samsung SDI Co.*, IPR2020-00349, Paper 53, at 12 (PTAB. July 15, 2021). Regardless, the disclosures in these exhibits do not change our depth of field analysis.

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(citing Ex. 1007, 12). Patent Owner emphasizes that other art such as Treuillet also refers to a single point of optimal distance. *Id.* at 36–40. Patent Owner’s witness, Dr. van der Weide, testifies that image will degrade if distance moves away from the optimally focused position and that a person of skill in the art would, thus, not modify Plassmann to include additional beamers. Ex. 2013 ¶¶ 146–189.

Patent Owner’s argument is unavailing because stereophotogrammetry devices having depth of field were known in the art. Ex. 1003 ¶¶ 113, 115, 385; Pet. Reply 19; *see Randall Mfg. v. Rea*, 733 F.3d 1355, 1362–63 (Fed. Cir. 2013) (providing that it is appropriate to consider such knowledge as part of an obviousness analysis). For example, Treuillet teaches with respect to the MAVIS II stereophotogrammetry device that “[t]o simplify the image capture, two tube-shaped projectors produce beams of light which intersect in a single spot when the camera is held at the right distance (about 80 cm from the wound),” and that “[e]xact positioning is not required: images can be taken in a volume of ± 15 cm around this point.” Ex. 1016, 755. This teaching supports that exact positioning is not required and that images can be taken within a 30 cm region evidences the depth of field for the MAVIS II. Ex. 1016, 755; Ex. 1053 ¶¶ 55–56.

Similarly, we find unavailing Patent Owner’s argument that Treuillet’s teaching that the beams of light intersect at “the right distance” equates to “the distance of optimal focus or where the image is sharpest,” and limits the MAVIS II to using that distance. PO Resp. 36 (citing Ex. 1016, 755; Ex. 2013 ¶154). This teaching refers to reaching the pre-defined distance, rather than limiting the depth of field. Ex. 1016, 755. We also find unavailing Patent Owner’s arguments that Treuillet teaching that “images can be taken in a volume of ± 15 cm” does not teach a depth of field, and

that “[c]an’ is not ‘should.’” PO Resp. 41–42 (citing Ex. 2013 ¶¶ 180–182). The references’ teachings correspond to what depth of field means and “can” expresses that capability of taking focused images within the depth of field. Ex. 1016, 755; Ex. 1003 ¶ 37; Ex. 2006 ¶ 47; Ex. 1001, 6:15–16; Ex. 1020, 4:20–24.

In addition, Hoeffelin¹⁶ teaches a stereophotogrammetry device having a 40 cm depth of field, which is sufficient to image both the face and torso. *See* Ex. 1015, 8–9 (disclosing “that the focal length needs to be respected (between 80 and 120 cm)”); Ex. 1003 ¶ 169; Ex. 1053 ¶ 61. We find unavailing Patent Owner’s argument that Hoeffelin teaches that “the focal length needs to be respected,” or otherwise brings risk of distortion. PO Resp. 36–37 (citing Ex. 1015, 8–9; Ex. 2013 ¶ 156). Patent Owner ignores the “(between 80 and 120 cm)” range that immediately follows and modifies the focal length statement, and expresses a depth of field. Ex. 1015, 8–9.

Moreover, we find unavailing Patent Owner’s arguments to the extent that they focus only on Plassmann’s depth of field. *See* PO Resp. 31–36; PO Sur-reply 17–20. These arguments are directed to Plassmann’s teachings individually, which is the incorrect focus. *Cf. In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (“Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references”); *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). In addition, these arguments are akin to arguing that Plassmann and Treuillet’s teachings cannot be physically combined, which

¹⁶ H. Hoeffelin, et al., *A Methodological Evaluation of Volumetric Measurement Techniques including Three-Dimensional Imaging in Breast Surgery*, BioMed Research Int’l, vol. 14, 8 (Jan. 2014) (Ex. 1015).

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is an improper focus for determining non-obvious. *See Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (quoting *In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983)); *see also id.* (quoting *In re Etter*, 756 F.2d 852, 859 (Fed. Cir. 1985) (en banc)) (“Etter’s assertions that Azure cannot be incorporated in Ambrosio are basically irrelevant, the criterion being not whether the references could be physically combined but whether the claimed inventions are rendered obvious by the teachings of the prior art as a whole.”).

We also find unavailing Patent Owner’s argument that that there would be no reason to combine Staller’s teachings with Plassmann because Plassmann has no need for additional beamers to provide repeatable scale. PO Resp. 38–40. More specifically, Patent Owner argues that “with Plassmann, the scale of the 3D reconstruction is already known exactly from the calibration and triangulation methodology,” and “[t]herefore, Plassmann already enables wound images to be viewed over successive examinations at repeatable scale(s) and at varying levels of magnification.” *Id.* (citing Ex. 2013 ¶ 165). Even if, as Patent Owner argues, one of ordinary skill in the art could develop or utilize different solutions to address scale, this does not make Staller’s solution less obvious. *Cf. Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (“[A] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.”). Moreover, the ability to consistently take images from different positions using multiple beamers would still have utility.

We also find unavailing Patent Owner’s argument that “Treuillet criticizes MAVIS II, calling it ‘cumbersome’ and stating ‘all the previous systems are unsuitable for general use in clinical settings.’” PO Resp. 43–44

(quoting Ex. 1016, 752, 755, 761). Patent Owner further argues that Treuillet criticizes that Plassmann's MAVIS II requires "careful calibration." *Id.* at 44. These arguments, however, do not undermine our finding above that a person having ordinary skill in the art would have understood that the MAVIS II device had a useable depth of field and that Plassmann would benefit from having multiple positioning beamers within that depth of field. Treuillet does not denigrate the notion of using multiple beamers with MAVIS II. *Cf. In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004) ("The prior art's mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the [claimed solution].").

We also find unavailing Patent Owner's argument that the "MAVIS II" device that Treuillet describes is not the same as the "MAVIS" device Plassmann refers to. PO Resp. 41. The preponderance of the evidence supports that a person of ordinary skill in the art would have understood that a "MAVIS" device of the Plassmann reference, regardless of whether or not it was precisely the same as MAVIS II, would have had the same depth of field (or, at a very minimum, some usable depth of field). In particular, Dr. Plassmann referred to MAVIS as also having a 30 centimeter depth of field. Exhibit 2040 (originally marked Exhibit 1048 during deposition) is an article by Dr. Plassmann entitled "Accuracy and Precision of the Hand-Held MAVIS Wound Measurement Device." In that article, Dr. Plassmann explains that the MAVIS includes a projector that "produces two beams of light that intersect at the centre of the middle of the field of view and in halfway in the field of depth (approximately 80 cm in front of the camera)." Ex. 2040, 3; *see also* Ex. 1054, 120:9–12 (inventor, Dr. Thirion, testifying that he saw the Exhibit 2040 article before filing the application leading to

the '119 patent). Also, the '119 patent's inventor, Dr. Thirion, acknowledged that the device from the Plassmann reference resemble[d] the MAVIS II system." Ex. 1054, 85:19–88:1. Dr. Otto also testifies that a person of ordinary skill in the art would have understood that the Plassmann article refers to the "MAVIS II" device when using the term "MAVIS." Ex. 1003 ¶ 114.

Patent Owner does not persuasively dispute that Plassmann's device would have some depth of field. Rather, Patent Owner's witness, Dr. van der Weide, admits that every stereophotogrammetry device has some depth of field. Ex. 2006 ¶ 78 ("[A] stereophotogrammetry device does not have zero depth of field."); *see also* Ex. 1054, 119:11–16 (the '119 patent's inventor, Dr. Thirion, stating that "every camera has a depth of field"). Patent Owner also does not present persuasive evidence disputing that a person of skill in the art would have understood that the Plassmann's MAVIS device would have the depth of field described in Treuillet.

Thus, in light of the above, we find that one of ordinary skill in the art would have found it obvious to modify Plassmann's stereophotogrammetry device, based on what was known in the art, to have multiple predefined distance positions for repeatability. Plassmann already teaches use of one pair of light beams for positioning, and a person of skill in the art would have understood that the Plassmann device could benefit from multiple pairs of light beams in the same way the Staller device benefits from the multiple pairs of light beams to enable positioning at more than one repeatable distance from the camera. Ex. 1003 ¶¶ 138–139. As the Supreme Court has explained:

[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would

improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill, . . . [A] court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.

KSR, 550 U.S. at 417 (emphasis added).

c) Claim 1

We next address obviousness of each claim recitation starting with claim 1.

The preamble of claim 1 recites “[a] device for stereophotogrammetry comprising.” For purposes of our analysis, we do not need to decide whether or not this preamble is limiting. Even if the preamble were limiting, the preponderance of the evidence supports that Plassmann discloses a device for stereophotogrammetry. Pet. 30–31; Ex. 1007, Figs. 1A, 1B, 12:25–29; Ex. 1003 ¶ 103. Patent Owner does not persuasively dispute this recitation.

Claim 1 next recites “a camera body.” As Petitioner argues, the preponderance of the evidence supports that Plassmann discloses a camera body. Pet. 31; Ex. 1007, Fig. 1A, 5:29–30, 12:3–4; Ex. 1003 ¶ 105. Petitioner adds that Plassmann teaches using “a camera body such as is well-known to those skilled in the art.” *Id.* at 30 (quoting Ex. 1007, 5:29–30, 12:3–4). Patent Owner does not persuasively dispute this recitation.

Claim 1 next recites “a double-optics (2) comprising two sub-optics (2*b*) and (2*c*), configured for a simultaneous acquisition of two views according to two different angles.” Pet. 32–34 (citing Ex. 1007, 21:14–25, Fig. 1B; Ex. 1003 ¶¶ 107–110). As Petitioner argues, the preponderance of the evidence supports that Plassman teaches this recitation.

Petitioner annotates Plassmann’s Figure 1B, which we reproduce below with Petitioner’s annotations. Pet. 33.

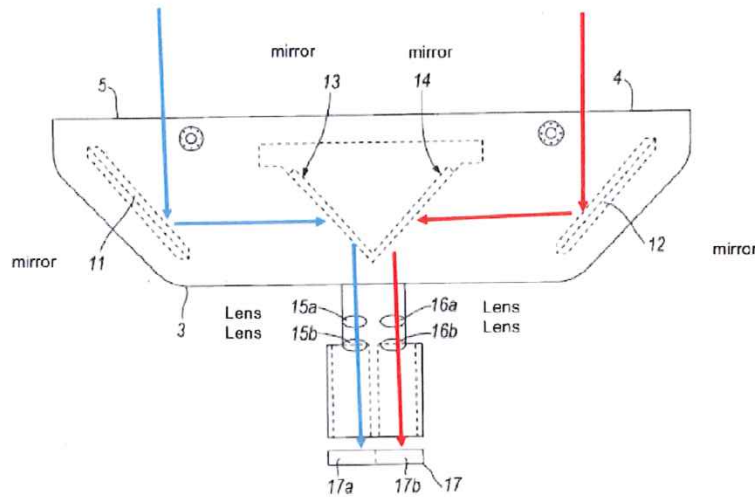


Fig. 1B
PRIOR ART

Plassmann’s Figure 1B depicts a plan view of an adaptor used with the MAVIS apparatus. Ex. 1007, 11:5–6, 11:25–12:29. Petitioner annotates Figure 1B with red and blue lines to illustrate that Plassmann “comprises double-optics employing two sets of sub-optics (i.e.,] 11, 13, 15a, and 15b (blue) and 12, 14, 16a, and 16b (red)).” Pet. 34.

Petitioner persuasively argues that “Plassmann’s Figure 1B is substantially identical to the ’119 patent’s figures depicting the claimed double optics and two sub-optics.” Pet. 33–34 (citing Ex. 1007, Fig. 6; Ex. 1003 ¶¶ 108–109). Petitioner argues that Plassmann teaches, for example, that light forming the first image (depicted by blue annotations) hits the adaptor, hits mirror 11 and then mirror 13 before passing through lenses (15a,b). *Id.* at 20–21 (citing Ex. 1007, 12:14–22; Ex. 1003 ¶ 78). According to Petitioner, one of ordinary skill in the art “would recognize that the combination of mirrors and lenses traversed by each light path in Plassmann . . . comprises double-optics employing two sets of sub-optics (*i.e.* 11, 13,

15a, and 15b (blue) and 12, 14, 16a, and 16b (red)) as recited.” *Id.* at 34 (citing Ex. 1003 ¶ 109). Petitioner adds that “because of the spaced mirrors 11 and 12, the two images are necessarily taken at different angles.” *Id.* In addition, Petitioner argues that “[b]ecause the images are captured using a single camera . . . [one of ordinary skill in the art] would understand that they are obtained simultaneously.” *Id.*

We agree with Petitioner and find that one of ordinary skill in the art would have recognized that the combination of mirror and lenses comprises double-optics employing two sets of sub-optics (*i.e.* 11, 13, 15a, and 15b (blue) and 12, 14, 16a, and 16b (red)). Ex. 1007, 12:14–25, Fig. 1B; Ex. 1003 ¶ 235; Pet. 32. More specifically, we agree with Petitioner and find that Plassmann teaches having two sub-optics, which are displaced from one another, and which each collect light from the subject to be imaged (viewed). *See, e.g.*, Ex. 1007, 12:14–25, Fig. 1B. Plassmann teaches that the light collected by each sub-optic comprises the light that passes through the respective aperture 4 or 5, and traverses different sets of mirrors and lenses to be focused on a different part of a charged coupled device to form respective first and second images (views). *Id.* at 12:14–25, Fig. 1B.

We also agree with Petitioner and find that due to spaced mirrors 11 and 12—which are part of different light paths and which are hit by the light that passes through their respective aperture 4 or 5—the two images (views) are necessarily acquired at different angles. Ex. 1007, 12:14–25, Fig. 1B; Ex. 1003 ¶ 235; Pet. 32. Moreover, each sub-optic receives light from, for example, the center point of the object to be imaged from a different angle due to the spaced mirrors 11 and 12, as well as depending on the curvature of the subject and which point on the subject from which the light originates. *Id.*; *see also* PO Resp. 28 (admitting that “[i]t is true that, when a subject is

imaged using a stereophotogrammetry device having two sub-optics, the ‘angle’ between a point of the subject and each sub-optic is different”).

In addition, the ’119 patent Specification describes the claimed double optics as follows: “A double optics (2) adapted to the camera body (1) and composed of two sub-optics (2b) and (2c), enabling the acquisition of a stereo pair corresponding to two slightly different viewing angles.” Ex. 1001, 8:24–27. Notably, the passage provides that having two sub-optics enables acquiring a stereo pair “corresponding to two slightly different viewing angles,” without addressing the sub-optics’ orientation. *Id.*

Lastly, we agree with Petitioner and find that because images (views) are captured using a single camera, one of ordinary skill in the art would have understood they are obtained simultaneously. Ex. 1003 ¶ 235.

We find unavailing Patent Owner’s arguments disputing that Plassmann teaches this limitation. PO Resp. 23–30. Patent Owner’s arguments are premised on its construction (which we do not adopt) of the plain and ordinary meaning for this limitation which excludes parallel view sub-optic configurations. *Id.* Put differently, Patent Owner argues that having the sub-optics spaced apart from each other is insufficient to teach “two views according to two different angles.” *Id.* As we discuss above, this is incorrect. Thus, Patent Owner’s discussions regarding the optical axes of the sub-optics and their orientations are inapposite in light of the proper construction for “two views according to two different angles.” *Id.*

Moreover, we afford the testimony of Dr. van der Weide, Patent Owner’s declarant, little weight with regard to this issue, as it is based on the incorrect claim construction for “according to two different angles,” and

does not explain otherwise a basis for the testimony that the two images are acquired at the same angle. Ex. 2013 ¶¶ 113–141.¹⁷

In sum, we are persuaded that Petitioner demonstrates by a preponderance of the evidence that Plassmann teaches “a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views according to two different angles.”

Claim 1 next recites “wherein the device is comprising a positioning system (34) configured to define a position of a target subject (S) for one of at least two distinct pre-defined point positions (A3, A4) of the target subject (S) relative to the stereophotogrammetry device.” Ex. 1001, 11:32–57. As Petitioner argues, the preponderance of the evidence supports that the combination of Plassmann, Treuillet, and Staller teaches or suggests this limitation and, as we explain above, the evidence supports that a person of ordinary skill in the art would have had reason to combine these references’ teachings to meet this limitation with a reasonable expectation success. Pet. 34–40.

First, as Petitioner argues, the preponderance of the evidence supports that Plassmann teaches a positioning system that uses a pair of light beamers to signal when a target subject is reaching a predefined distance position to the camera. *See* Ex. 1007, Fig. 1A (light beamers 6a, 6b); Pet. 34–35. Plassmann teaches that these light beams converge at a predefined distance

¹⁷ Petitioner argues that Plassmann and its Figure 3A suggest that its sub-optics are angled inwardly such that this recitation would be met “[e]ven if the Board were to exclude parallel suboptics from the claims.” Pet. Reply 8. It is not necessary to reach this issue because we did not adopt Patent Owner’s construction.

“corresponding to the distance at which the camera lens is focused.”

Ex. 1007, 12:7–13. More specifically, Plassmann states the following:

The apparatus is also provided with two low-powered light emitting diodes (LEDs) 6a, 6b, each provided with a focussing lens to produce a beam of light and being arranged so that the beams converge and meet at a point a fixed and desired distance from the apparatus, this distance corresponding to the distance at which the camera lens is focussed.

Id.; Pet. 34–35. Accordingly, we find that Plassmann teaches the limitation, save for having a second predefined distance position—if there are two different distance positions, one necessarily is closer to the camera body and the other one farther. Ex. 1007, 12:7–13, Fig. 1A.

Second, as Petitioner argues, a preponderance of the evidence supports that Staller teaches a positioning system having more than one predefined imaging distance position. Pet. 41–42. More specifically, we find that Staller teaches a strobe diffuser attachment for a camera, which includes a “distance measurement device [that] may be adapted to selectively produce one of a plurality of pairs of light beams which intersect at different repeatable distances from the diffuser body.” Ex. 1006, code (57), 2:29–32, 5:13–15; *see also id.* at 5:56–6:2 (“[T]wo pairs of light beam emitters . . . may be used to provide three or four separate pairs of intersecting bea[m]s and three or four corresponding repeatable distances for diffuser 10.”); Pet. 38. In other words, Staller teaches having at least two distinct predefined distance positions for the camera. Ex. 1006, code (57), 2:29–32, 5:13–15, 5:56–6:2.

We also find that Staller teaches that its “distance indicator improves the usefulness of close range photography by providing a repeatable scale to photographs[, which] . . . improves the usefulness of close ranges

photographs for medical and other organic growth measurement applications.” Ex. 1006, 6:10–15. Plassmann also teaches that “[s]tereoscopic imaging has been known for many years,” and “ha[s] been used to measure the shape of wounds and the like which are otherwise difficult to measure by conventional techniques.” Ex. 1007, 1:6–15. We find that it was known in the art before the ’253 patent to use a camera having multiple predefined distances for imaging a subject in connection with wound or lesion treatment. *See* Ex. 1017,¹⁸ 579; Ex. 1011,¹⁹ 164, Fig. 2, Table 2; Ex. 1008,²⁰ 481.

Based on the record as a whole and as we explain when addressing reasons to combine, *supra* Sec. V.F.4.a, we determine that Petitioner has adequately established that a person of skill in the art would have had reason to modify Plassmann to include predefined distances as suggested by the combined teachings of Plassmann, Treuillet, and Staller.

Claim 1 next recites “wherein the device comprises a switch (5) comprising a first selection position configured to select the farther point position (A3) and a second selection position configured to select the closer point position (A4).” As Petitioner argues, a preponderance of the evidence supports that Staller teaches such a switch. Ex. 1006, Fig. 1, 5:38–43; Ex. 1003 ¶¶ 131–133; Pet. 43–44. Patent Owner does not persuasively dispute this point.

¹⁸ Gwen Clarke, *Recording Wounds: Polaroids New Medically Designed Camera*, British Journal of Community Nursing, vol. 5, no. 11 (Sept. 27, 2013) (“Clarke”).

¹⁹ Melvin A. Shiffman, *A New Camera for Cosmetic Surgery*, The Am. J. Cosmetic Surgery, vol. 15, no. 2 (June 1, 1998) (“Shiffman”).

²⁰ Clare Williams, *Wound care assessment with the Polaroid Macro 3 SLR*, British J. Community Nursing, vol. 6, no. 9 (2001) (“Williams”).

Claim 1 next recites “wherein the switch (5) is configured to switch on the first pair of light beamers (3*b*, 3*c*) in the first selection position and wherein the switch (5) is configured to switch on the second pair of light beamers (4*b*, 4*c*) in the second selection position.” As Petitioner argues, a preponderance of the evidence supports Staller teaches such a switch. Ex. 1006, Fig. 1, 5:38–43; Ex. 1003 ¶¶ 131–136; Pet. 44–45. Patent Owner does not persuasively dispute this point.

In summary, we determine that Petitioner shows by a preponderance of the evidence that claim 1 would have been obvious to one of ordinary skill in the art in view of the combination of Plassmann, Treuillet, and Staller.

c) Claim 2

Claim 2 recites “[t]he device according to claim 1 wherein the at least two distinct pre-defined positions (A3, A4) are included in a space region corresponding to a depth of field (6) of the double-optics (2).” Ex. 1001, 11:58–61. As Petitioner argues, the preponderance of the evidence supports that a person having ordinary skill in the art would have reason to ensure that each predefined position falls within Plassmann’s depth of field to obtain focused images. Ex. 1003 ¶¶ 145–146; Pet. 47. Patent Owner does not persuasively dispute this point.

d) Claim 3

Claim 3 recites “[t]he device according to claim 1 wherein the closer point position (A4) and the farther point position (A3) are such that a surface of a field of view corresponding to the farthest point position (A3) is at least 25% larger than a surface of a field of view corresponding to the closer point position (A4).” Ex. 1001, 11:62–67. To address this recitation, Petitioner

argues that it would have been obvious to a person having ordinary skill in the art to define a farther position 25% larger than the closer position. Pet. 49. Petitioner persuasively argues that Plassmann and Treuillet both disclose that Plassmann could be used for wound monitoring. *Id.* Petitioner also persuasively argues that a person of ordinary skill in the art would have understood that wound-monitoring devices could employ close and far positions which differ in magnification by more than 200%. *Id.* A preponderance of the evidence including the Clark reference evidences this point. Ex. 1017; Ex. 1003 ¶ 153.

Petitioner further argues a person having ordinary skill in the art would have also understood that a Plassmann-type stereophotogrammetry device could be used for imaging face or breasts. Pet. 50. A preponderance of the evidence also supports this position. The '119 patent acknowledges that stereophotogrammetry devices had been used for 3D reconstructions of face and breasts in A3 and A4 surface format. Ex. 1001, 1:41–48; Ex. 1003 ¶¶ 154–155. Note, however, that the '119 patent states that specialists use “two distinct stereophotogrammetry cameras” for acquiring 3D representation of faces or breasts. Ex. 1001, 1:49–52.

Petitioner's witness, Dr. Otto, calculates that Plassmann's 30-centimeter depth of field would be sufficient to encompass a “surface field of view” equivalent to the A4 format and equivalent to the A3 format (different by more than 25%). Pet. 50–51 (citing Ex. 1003 ¶¶ 156–157). Dr. Otto also testifies that, while Plassmann and Treuillet do not disclose focal length of the Plassmann device's lenses, a person having ordinary skill in the art would understand that different lenses could be employed to achieve different results. Pet. 51 (citing Ex. 1003 ¶¶ 158–166). Dr. Otto further explains that a person of ordinary skill could configure a Plassmann

device to take both A3 and A4 formats within the depth of field of the Plassmann device. *Id.* Dr. Otto further explains that a person of ordinary skill would understand that any suitable lens could be used to achieve imaging goals. *Id.* at 51–52, 54 (citing Ex. 1003 ¶¶ 167, 172–173).

Petitioner further argues that a person having ordinary skill in the art would have known that similar stereophotogrammetry devices could image face and bodies, such as the LifeViz II device. Pet. 52–53; Ex. 1014, 2 (depicting images of faces and breasts using LifeViz II); Ex. 1003 ¶ 168. Petitioner argues that Hoefflin teaches that LifeViz II has a depth of field from 80–120 cm and that a person of ordinary skill in the art would have thus understood that a 40-centimeter depth of field would be sufficient to encompass A4 format and 100% larger A3 format. Pet. 53 (citing Ex. 1003 ¶¶ 169–170; Ex. 1015, 8–9). Dr. Otto confirmed that such a device could encompass these formats. *Id.* (citing Ex. 1003 ¶ 171).

Patent Owner argues that Dr. Otto’s analysis and conclusions are flawed. PO Resp. 46. Patent Owner argues, as Petitioner acknowledged, that neither Plassmann nor Treuillet disclose actual focal length of the lenses, and Patent Owner argues that this means neither references teaches “field of view.” *Id.* (citing Ex. 2013 ¶¶ 102–193; Ex. 1003 ¶ 158). Patent Owner, thus, emphasizes that Dr. Otto relies on replacing Plassmann’s lenses to reach A4 and A3 formats. *Id.* at 47.

Patent Owner then argues that Dr. Otto’s calculations and approach err because they are based on a single pyramidal view rather than considering, as is necessary for stereophotogrammetry, the intersection of two separate view frustums. *Id.* at 48. Patent Owner’s witness, Dr. van der Weide, explains this error. Ex. 2013 ¶¶ 196–199. Patent Owner further argues that depth of field is controlled by lens aperture and that Dr. Otto

could not evaluate Plassmann's depth of field without lens aperture dimensions. PO Resp. 49–50 (citing Ex. 2013 ¶ 200).

Patent Owner also argues that, even under Dr. Otto's calculations, the subject would have to be imaged 64.5 cm from the camera which is outside of the 65–95 cm depth of field Dr. Otto calculates. *Id.* at 50 (citing Ex. 1003 ¶ 157; Ex. 2013 ¶ 201).

Patent Owner also disputes that Petitioner and Dr. Otto incorrectly contend that LifeViz II could image the face and torso. Patent Owner emphasizes that the face image is from a QuantifiCare advertisement while the torso image is from Hoefflin, which used a different camera. *Id.* at 51–53 (citing Ex. 1014, 1–2; Ex. 1015, 2, 3, 4); Ex. 2013 ¶¶ 204–205; Ex. 2019 ¶¶ 20, 23–24). Patent Owner further argues that Hoefflin only provides focal length rather than depth of field. PO Resp. 53 (citing Ex. 1005, 8–9; Ex. 1015, 4; Ex. 2013 ¶ 296). Patent Owner also argues that Polaroid's Macro SLR 3 and 5 used different lenses with different focus distances to achieve different magnification. *Id.* at 53–54 (citing Ex. 2013 ¶¶ 207–208).

Patent Owner then argues that, because of Dr. Otto's analytic errors, Petitioner has not shown that modified devices would meet claim 3 or that a person having ordinary skill in the art could determine how to modify the devices with a reasonable expectation of success. PO Resp. 54.

Considering all of the evidence before us, the preponderance of the evidence supports that a person having ordinary skill in the art would have had reason to configure Plassmann as claim 3 recites (to be able to take both face and breast stereo-photos) and would have understood that suitable lenses and focus distance could be employed to achieve claim 3's field of view. We find Dr. Otto's testimony credible and Petitioner's position persuasive based on the evidence the Petition cites.

In particular, the preponderance of the evidence suggests that a person of skill in the art would have known the benefit of creating stereophotogrammetric 3-D images of both faces and breasts. *See* Ex. 1001, 1:41–48 (admitting known desire to create images of faces and breasts); Ex. 1014, 2 (suggesting that LifeViz device can create 3-D face image); Ex. 1015, 3 (suggesting LifeViz device can create 3-D breast images). The preponderance of the evidence further supports that a person having ordinary skill in the art would have known that the device described by Plassmann and Treuillet could be configured to create these images with a reasonable expectation of success by making use of various lenses, focal lengths, depth of field, and so forth to define closer and farther imaging positions as desired and, in particular, to reach the recitations of claim 3 for face and breast imaging. Pet. 54; Ex. 1003 ¶ 172; Ex. 1053 ¶¶ 69–74.

Patent Owner’s arguments that Petitioner’s witness, Dr. Otto, miscalculates the precise adjustments that would allow such imaging (PO Resp. 46–53) do not undermine Petitioner’s rationale as to why a person having ordinary skill in the art would combine the references’ teachings to reach claim 3 or would have reasonable expectation of success reaching claim 3. As Petitioner points out, Patent Owner lacks evidence that would undermine Petitioner’s position that such a device would have been desired and achieving such a device would have been within ordinary skill in the art. Reply 21. Thus, the preponderance of evidence as to this more general proposition remains true even if Patent Owner were correct that Dr. Otto’s precise calculations were in error. Petitioner does not have a burden to provide precise dimensions of an obvious device within the scope of claim 3. Rather, Petitioner needs to show that a person having ordinary skill in the art would have had both a reason to combine and reasonable expectation of

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success as to reaching claim 3's recitations. As we explain above, Petitioner meets this burden.

In sum, we find that Petitioner demonstrates by a preponderance of the evidence that claim 10 would have been obvious to one of ordinary skill in the art over Plassmann, Treuillet, and Staller.

e) Claim 4

Claim 4 recites:

The device according to claim 3 wherein the field of view corresponding to the closer point position (A4) is equal to a normalized surface format A4, that is 21 cm times 29.7 cm, with possible variations of plus or minus 40% of a surface of the normalized surface format A4 and the field of view corresponding to the farther point position (A3) is equal to a normalized surface format A3, that is 29.7 cm times 42 cm, with possible variation of plus or minus 40% of a surface of the normalized surface format A3.

Ex. 1001, 12:1–9. For largely the same reasons as claim 3, Petitioner argues that it would have been obvious to a person having ordinary skill in the art to select a field of view that corresponds to A3 surface format and a second field that corresponds to A4. Pet. 54–55. Patent Owner argues that Petitioner does not meet its burden for the same reasons as claim 3. PO Resp. 54–55. As we explain above, the preponderance of the evidence supports Petitioner's position. *See also* Ex. 1003 ¶¶ 176–178 (Dr. Otto addressing claim 4).

f) Claim 8

Claim 8 first recites “[a] method comprising using the stereophotogrammetry device according to claim 1 comprising.” Ex. 1001, 12:31–32. As explained above, the combined teachings of Plassmann, Treuillet, and Staller disclose each recitation of claim 1. As explained below,

Petitioner also adequately establishes that the references disclose all steps of the method of using the claim 1 device. Pet. 56.

Claim 8 next recites “activating the switch (5) of the positioning system (34) to select one out of the at least two distinct point positions (100).” Ex. 1001, 12:33–35. As we explain above and as Petitioner argues, the preponderance of the evidence supports that Staller discloses such a switch. A person of ordinary skill in the art would also understand that Staller suggests activating the switch. Pet. 56; Ex. 1003 ¶ 182. Patent Owner does not persuasively dispute this point.

Claim 8 next recites “switching on the first pair of light beamers (3*b*, 3*c*) if the first selection position configured to select the farther point position (A3) is selected or switching on the second pair of light beamers (4*b*, 4*c*) if the second selection position configured to select the closer point position (A4) is selected.” Ex. 1001, 12:42–44. As we explain above and as Petitioner argues, the preponderance of the evidence supports that Staller discloses such a switch. A person of ordinary skill in the art would also understand that Staller suggests activating the switch. Pet. 56; Ex. 1003 ¶ 184. Patent Owner does not persuasively dispute this point.

Claim 8 next recites “moving the stereophotogrammetry device and/or the target subject (S) so that the target subject (S) is at that selected pre-defined point position (200).” Ex. 1001, 12:42–44. As explained above and as Petitioner argues, the preponderance of the evidence supports that Plassmann and Treuillet disclose a positioning system configured to allow the device “to be relocated at the same repeatable distance from a subject as demonstrated in FIG. 4.” Ex. 1006, 5:19–21; Pet. 57; *see also* Ex. 1003 ¶¶ 186–188. Patent Owner does not persuasively dispute this point.

Claim 8 next recites “taking one or several stereo-pairs at that selected

predefined point position (300).” Ex. 1001, 12:45–46. As explained above and as Petitioner argues, the preponderance of the evidence supports that Plassmann teaches taking a stereo-pair at the selected point position. Pet. 57–58; Ex. 1007, 12:9–26; Ex. 1003 ¶¶ 189–190. Patent Owner does not persuasively dispute this point.

In summary, Petitioner adequately establishes that the cited art teaches each recitation of each claim subject to this ground, and Petitioner adequately establishes reason to combine the references teachings to reach each claim subject to this ground. Thus, after fully considering the entire record including the weight of the evidence as to the cited references teaching each recitation of claims 1–4 and 8, the weight of the evidence supporting reason to combine the cited references with reasonable expectation of success, and the weight of evidence supporting objective indicia of non-obviousness, we conclude that Petitioner persuasively establishes by a preponderance of the evidence that the subject matter of claims 1–4 and 8 would have been obvious in view of Plassmann, Treuillet, and Staller.

F. Ground Two: Obviousness Based on Plassmann, Treuillet, Staller, and Peng

Petitioner asserts that the ’119 patent’s claims 9–11 would have been obvious over Plassmann, Treuillet, Staller, and Peng. We provide an overview of Peng before we address this ground.

1. Peng (Ex. 1009)

Peng is a paper that relates to an “automatic 3D reconstruction method” to reconstruct a 3D scene using “complementary stereo information from four cameras.” Ex. 1009, 1. In particular, Peng’s “3D model

reconstruction system us[es] images acquired from multiple stereo pairs.” *Id.* at 2. Peng explains that a “normal camera” has a “limited field-of-view.” *Id.* at 6. Accordingly, Peng describes a process to “reconstruct a large and integrated scene” by “finding more than three spatial matched points between different 3D models [and] can achieve 3D model stitching.” *Id.*; *see id.* at 2–3.

2. Discussion

Because Petitioner’s ground requires combining the teachings of Plassmann, Treuillet, Staller, and Peng (Pet. 5), we first address motivation to combine. *See KSR Int’l Co.*, 550 U.S. 398 at 418. We then address the recitations of each claim that this ground addresses.

a) Reason to combine

Petitioner argues that a person of ordinary skill in the art would have had reason to combine the disclosures of Plassmann, Treuillet, and Staller for the reasons we address above. Pet. 66. Petitioner argues that a person of ordinary skill in the art would have had reason to combine Peng’s teachings with the combined disclosures of Plassmann, Treuillet, and Staller because Peng relates to reconstruction of comprehensive 3-Dimensional representations. *Id.* Petitioner emphasizes that the ’119 patent admits that techniques of matching and stitching images were already known to persons of ordinary skill in the art. *Id.* (citing Ex. 1001, 2:6–39; Ex. 1003 ¶ 216). Petitioner argues that a person of ordinary skill in the art would recognize that Peng’s disclosures regarding reconstruction of 3-D images would be useful in the context of Plassmann, Treuillet, and Staller because they relate to providing stereophotogrammetry images of the face and torso of a subject as Peng discloses. *Id.* Petitioner argues that a person of ordinary skill in the art would expect success because such 3-D image reconstruction was known

in the art and because the '119 patent does not specify how such reconstruction should be performed. *Id.* at 67. A preponderance of the evidence supports Petitioner's position regarding reason to combine with reasonable expectation of success. Ex. 1001, 2:6–39, 7:20–27, 10:31–37; Ex. 1003 ¶¶ 216–219. Patent Owner does not persuasively dispute this position. PO Resp. 66–67.

a) Claim 9

Claim 9 first recites “[t]he method according to claim 8 comprising taking several stereo-pairs at the selected pre-defined point position and.” Ex. 1001, 12:47–49. Petitioner argues that the '119 patent and prior art acknowledge that a person of ordinary skill in the art would have understood that more than one stereo-pairs is necessary to create a 3-D construction of certain curved surfaces. Pet. 59–60. Petitioner further argues that Hoefflin teaches stitching five views together. *Id.* Thus, Petitioner argues that the combination of references discloses this element. The preponderance of the evidence supports Petitioner's position. Ex. 1001, 1:65–2:5, 2:6–15; Ex. 1003 ¶¶ 193–196; Ex. 1015, 2. Patent Owner does not persuasively dispute this point.

Claim 9 next recites “reconstructing 3-Dimensional surfaces of the target subject (S) corresponding to each of the stereo-pairs (400); and.” Ex. 1001, 12:50–52. Petitioner argues that reconstructing 3-Dimensional purposes is the primary purpose of stereophotogrammetry for image pairs and a person of ordinary skill in the art would have been well acquainted with techniques for such reconstruction. Pet. 60–64. The preponderance of the evidence including, for example, disclosures of Treuillet and Peng, supports Petitioner's position. Ex. 1003 ¶¶ 197–211; Ex. 1009, 6; Ex. 1016, 755, 756. Patent Owner does not persuasively dispute this point.

Claim 9 next recites “matching the different 3-Dimensional surfaces in space (500); and.” Ex. 1001, 12:53–54. As Petitioner argues, the preponderance of the evidence supports that Peng supports such matching to achieve reconstruction as referenced in Plassmann and Treuillet. Pet. 64; Ex. 1003 ¶¶ 210–212; Ex. 1009, 1–2, 6. Patent Owner does not persuasively dispute this point.

Claim 9 next recites “stitching together the different surface pieces of the target subject (S) into a comprehensive 3-Dimensional representation (600).” Ex. 1001, 12:55–57. As Petitioner argues, the preponderance of the evidence supports that Peng teaches such stitching. Pet. 65–66; Ex. 1003 ¶¶ 213–215; Ex. 1009, Figs. 9(b), 2, 7, 8. Patent Owner does not persuasively dispute this point.

b) Claim 10

Claim 10 recites “[t]he method according to claim 9 comprising using a computer program product stored on a non-transitory media to operate the steps of reconstructing, matching, and stitching.” Ex. 1001, 12:58–61. As Petitioner argues, Plassmann and Treuillet suggest using a computer executing software to accomplish the recited steps. Pet. 67–68; Ex. 1003 ¶¶ 220–222; Ex. 1007, 12:25–29; Ex. 1009, 2–6; Ex. 1016, 754–758. Patent Owner does not persuasively dispute this point.

c) Claim 11

Claim 11 first recites “[t]he method according to claim 8 comprising selecting (100): Either the closer point position (A4) and then placing a face of the target subject (S) at the closer point position.” Ex. 1001, 12:62–65. As Petitioner persuasively argues, the preponderance of the evidence supports that the cited references teach this recitation. Pet. 68; Ex. 1003 ¶ 223. Patent Owner does not persuasively dispute this point.

Claim 11 next recites “and then taking several stereo-pairs of the face of the target subject (S) at the closer point position, processing these stereo-pairs to reconstruct 3-Dimensional surfaces of the face of the target subject (S), then matching these different 3-Dimensional surfaces in space and finally stitching together these different 3-Dimensional surfaces into a comprehensive 3-Dimensional surface representation (710) of the face of the target subject (S); or.” Ex. 1001, 12:66–13:7. As Petitioner argues, the cited references teach this recitation. Pet. 69; Ex. 1003 ¶ 224.

Claim 11 next recites

the farther point position (A3) and then placing a torso of the target subject (S) at the farther point position, and then taking several stereo-pairs of the torso of the target subject (S) at the farther point position, processing these stereo-pairs to reconstruct 3-Dimensional surfaces of the torso of the target subject (S), then matching these different 3-Dimensional surfaces in space and finally stitching together these different 3-Dimensional surfaces into a comprehensive 3-Dimensional surface representation (720) of the torso of the target subject (S).

Ex. 1001, 13:8–18.

As Petitioner persuasively argues, the cited references disclose the step of taking several stereo-pairs of the torso, when the closer position is selected, and matching and stitching resulting 3-dimensional surfaces in space to produce a comprehensive 3-D surface representation thereof. Pet. 69–70; Ex. 1003 ¶ 226.

Patent Owner argues that the Petition does not substantively discuss why claim 11 is obvious and, instead, incorrectly refers back to its explanation of claims 3 and 4. PO Resp. 68–69. In particular, Patent Owner argues that, as to claims 3 and 4, Petitioner fails to establish that it would have been obvious to create a device capable of imaging both the face and

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torso. *Id.* We disagree. Petitioner meets its burden as to claim 11 for substantially the same reasons we explain above as to claims 3 and 4.

In summary, Petitioner adequately establishes that the cited art teaches each recitation of each claim subject to this ground, and Petitioner adequately establishes reason to combine the references teachings to reach each claim subject to this ground. Thus, after fully considering the entire record including the weight of the evidence as to the cited references teaching each recitation of claims 9–11, the weight of the evidence supporting reason to combine the cited references with reasonable expectation of success, and the weight of evidence supporting objective indicia of non-obviousness, we conclude that Petitioner persuasively establishes by a preponderance of the evidence that the subject matter of claims 9–11 would have been obvious in view of Plassmann, Treuillet, Staller, and Peng.

G. Legal Sufficiency of the Petition

Patent Owner argues that the Petition is legally deficient because first, in related District Court litigation, Petitioner alleged that various claim recitations of claims 9 and 11 should be construed under Section 112(f) and, second, Petitioner violated 37 C.F.R. § 42.104(b) by not identifying how these recitations should be construed and by not identifying corresponding portions of the specification. PO Resp. 67–69.

Patent Owner’s arguments are unpersuasive. In this *inter partes* review, Petitioner argues that express construction is not necessary for any claim term. Pet. 17. This is sufficient under our Rules. *See* CTPG 44 (“[A] petitioner may include a statement that the claim terms require no express construction.”). Patent Owner does not identify any requirement that Petitioner must take a claim construction position in this proceeding that is

identical to a position taken in a still pending district court litigation. An inconsistency, however, can weigh against an argument on how to construe a claim term. Here, however, Patent Owner does not argue that Section 112(f) actually should apply to any claim term.

In addition, we do not find persuasive Patent Owner's reliance on *Orthopediatrics Corp. v. K2M, Inc.*, IPR2018-01548, Paper 9, at 9–12 (PTAB Mar. 1, 2019). PO Resp. 67–68. This Board decision is non-precedential and we find that under the facts here. For example, in *Orthopediatrics Corp.*, the construction of the term was in dispute, which is not the situation here as neither party argues Section 112(f) applies. Paper 9, at 9. And the petitioner in *Orthopediatrics Corp.* argued, *inter alia*, that its “petition is based on the claim constructions urged by Patent Owner in the related district court litigation,” but failed to “set forth Patent Owner’s position in the related [d]istrict [c]ourt litigation.” *Id.* at 9–10.

In sum, we do not find that the Petition in this proceeding is insufficient under 37 C.F.R. § 42.104(b).

VI. CONCLUSION²¹

For the above reasons, we determine that Petitioner establishes, by a preponderance of the evidence, that

²¹ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. §§ 42.8(a)(3), (b)(2).

(a) claims 1–4 and 8 of U.S. Patent No. 10,070,119 B2 are unpatentable under 35 U.S.C. § 103 as obvious over the combination of Plassmann, Treuillet, and Staller; and

(b) claims 9–11 of U.S. Patent No. 10,070,119 B2 are unpatentable under 35 U.S.C. § 103 as obvious over the combination of Plassmann, Treuillet, Staller, and Peng.

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–4, 8	103	Plassmann, Treuillet, Staller	1–4, 8	
9–11	103	Plassmann, Treuillet, Staller, Peng	9–11	
Overall Outcome			1–4, 8–11	

VII. ORDER

In consideration of the foregoing, it is hereby

ORDERED that Petitioner establishes by a preponderance of the evidence that claims 1–4 and 8–11 of U.S. Patent No. 10,070,119 B2 are unpatentable;

FURTHER ORDERED that Patent Owner’s Motion to Exclude is *denied* with respect to evidence addressed by § III.A, *supra*, and is *dismissed as moot* with respect to evidence addressed by § III.B, *supra*;

FURTHER ORDERED that Patent Owner’s Objections to Petitioner’s Demonstratives are *overruled*; and

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FURTHER ORDERED that, because this is a Final Written Decision, the parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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Case: 23-1917 Document: 13 Page: 81 Filed: 06/29/2023

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CANFIELD SCIENTIFIC, INC.,
Petitioner,

v.

QUANTIFICARE S.A.,
Patent Owner.

IPR2021-01518
Patent 10,165,253 B2

Before BRIAN J. MCNAMARA, JOHN D. HAMANN, and
BRIAN D. RANGE, *Administrative Patent Judges*.

HAMANN, *Administrative Patent Judge*.

JUDGMENT

Final Written Decision

Determining All Challenged Claims Unpatentable

Denying In Part and Dismissing In Part Patent Owner's Motion to Exclude

35 U.S.C. § 318(a)

I. INTRODUCTION

In this *inter partes* review, instituted pursuant to 35 U.S.C. § 314, Canfield Scientific, Inc. (“Petitioner”) challenges the patentability of claims 1–4, 8–12, 15, 16, and 20–23 (“the challenged claims”) of U.S. Patent No. 10,165,253 B2 (Ex. 1020, “the ’253 patent”), owned by QuantifiCare S.A. (“Patent Owner”). We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a) (2018) and 37 C.F.R. § 42.73 (2022). For the reasons discussed herein, we determine that Petitioner shows by a preponderance of the evidence that the challenged are unpatentable.

A. Procedural History

Petitioner filed a Petition requesting *inter partes* review of the challenged claims of the ’253 patent. Paper 1 (“Pet.”). Patent Owner filed a Preliminary Response. Paper 7. With our authorization, Petitioner filed a Preliminary Reply (Paper 14) to the Preliminary Response relating to claim construction, and Patent Owner filed a Preliminary Sur-reply (Paper 15) in response to the Preliminary Reply.

We instituted *inter partes* review of all of the challenged claims of the ’253 patent on all of the grounds raised in the Petition. Paper 16 (“Dec. on Inst.”), 31. Patent Owner filed a Response to the Petition. Paper 21 (“PO Resp.”). Petitioner filed a Reply to Patent Owner’s Response. Paper 30 (“Pet. Reply”). Patent Owner filed a Sur-reply to Petitioner’s Reply. Paper 42 (“PO Sur-reply”).

Patent Owner filed a Motion to Exclude certain of Petitioner’s evidence (Paper 46, “Mot. Excl.”) and Petitioner filed an Opposition. Paper 47 (“Opp. Mot. Excl.”). Patent Owner filed a Reply in support of its Motion. Paper 53 (“Reply Mot. Excl.”).

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Patent Owner filed objections to Petitioner's demonstratives. Paper 58 ("PO Objs."). Patent Owner alleges, *inter alia*, that certain of Petitioner's slides contain new argument. *See generally id.*

An oral hearing was held on December 14, 2022. A transcript of the oral hearing is included in the record. Paper 60 ("Tr.).

B. Real Parties-in-Interest

The parties identify themselves as the real parties-in-interest. Pet. 2; Paper 4, 1.

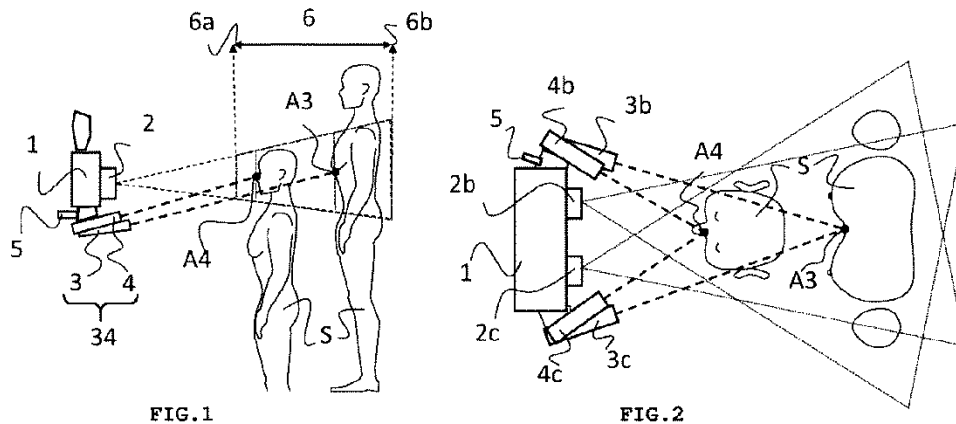
C. Related Matters

The parties identify the following as a related matter: *QuantifiCare, Inc. v. Canfield Scientific, Inc.*, C.A. No. 1:20-cv-12305 (D.N.J.). Pet. 3; Paper 4, 1. In addition, Petitioner has filed petitions for *inter partes* review of two additional patents related to the '253 patent, that also are owned by Patent Owner: (i) U.S. Patent No. 10,070,119 B2 ("the '119 patent") (IPR2021-01511) and (ii) U.S. Patent No. 10,681,334 B2 (IPR2021-01519).

D. The Challenged Patent

The '253 patent is titled "Device and Method to Reconstruct Face and Body in 3D." Ex. 1020, code 54. The '253 patent relates to a stereophotogrammetry device used "to picture and reconstruct in 3D the surface of objects of different sizes," e.g., different body parts such as the face and the torso. *Id.* at 3:27–30; *see id.* at 1:13–21, 1:48–55. By way of background, the '253 patent explains that "[s]tereophotogrammetry consists in [simultaneously] gathering the images of a subject from at least two view with a calibrated camera," i.e., a "stereo-pair." *Id.* at 1:31–36. The stereo-pair is used to "reconstruct . . . a dense representation in 3-Dimensions of the surface of the observed object." *Id.* at 1:37–39.

Figures 1 and 2, reproduced below, respectively show side- and top-views of an “implementation” of a stereophotogrammetry device and its components. *Id.* at 3:53–56.



Figures 1 represents a possible implementation of the '253 patent's device as viewed from the side, and Figure 2 represents a possible implementation of the device as viewed from the top. *Id.* As shown in Figures 1 and 2, camera body (1) includes double optics (2). *Id.* at 8:34–35. As shown in Figure 2, double optics (2) are “composed of two sub-optics (2b) and (2c), enabling the acquisition of a stereo[-]pair [of images] corresponding to two slightly different viewing angles” simultaneously. *Id.* at 8:35–38; *see id.* at 3:39–42. In addition, Figure 8 shows a series of stereo-pair images taken at different angles for a face. *Id.* at 11:12–19.

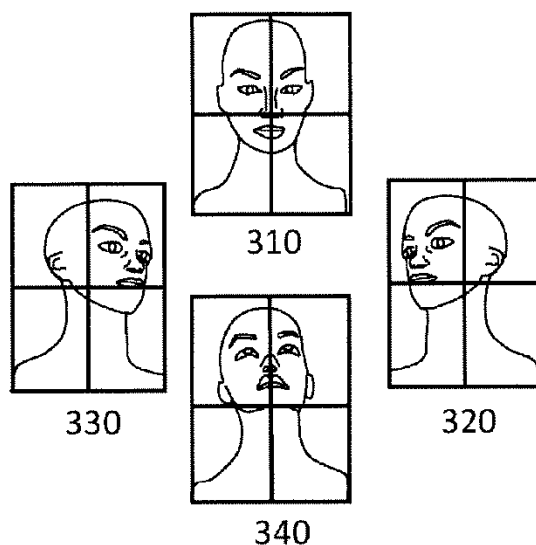


FIG. 8

The '253 patent specification describes Figure 8 as presenting “viewpoints optimized for imaging a face using a field of view close to an A4 surface format.” *Id.* at 4:4–5. Using the captured stereo-pairs, “a comprehensive representation in 3D of the surface of the subject (S)” can be constructed. *Id.* at 10:37–48.

Further, the stereophotogrammetry device captures stereo-pairs of images at “two distinct distances for picture taking corresponding respectively to position (A3) and (A4)” such that the stereo-pairs of images are in focus at positions A3 and A4, which are within the device’s depth of field 6. *Id.* at 8:40–50; *see id.* at 6:23–26. For example, position A3 is used for capturing images of the torso while position A4 is used for capturing images of the face. *Id.* at 6:14–16; *see id.* at 1:51–59. Positions A3 and A4 can be identified by the convergence of respective light patterns projected onto the subject to be imaged, the respective light patterns converging at the distances for positions A3 and A4. *Id.* at 4:51–5:5. For example, as shown

in Figure 2, a light pattern emitted by first pair of light beamers (3b) and (3c) converge at point (A3) and a different light pattern emitted by second pair of light beamers (4b) and (4c) converge at point (A4). *Id.* at 8:51–55; *see id.* at 4:61–64. Accordingly, “by placing the subject so that the light patterns projected by a first pair of beamers are superposed on the surface of the subject[,] one is placing the subject at” the first predefined position (and similarly for the light pattern emitted by the second pair of beamers converging at the second position). *Id.* at 4:57–61; *see id.* at 5:14–35.

E. Challenged Claims

Petitioner challenges claims 1–4, 8–12, 15, 16, and 20–23 of the ’253 patent. Pet. 5. Claim 1 is the only challenged independent claim. Claim 1 is illustrative of the challenged claims, and reads as follows:

1. A device for stereophotogrammetry comprising a camera body (1) and a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views according to two different angles, wherein the device is comprising a positioning system (34) configured to signal when a target subject (S) is reaching a pre-defined distance position to the camera (1) corresponding to one of at least two distinct pre-defined distance positions (A3, A4) of the target subject (S) relative to the camera body (1) of the stereophotogrammetry device, the at least two distinct predefined distance positions comprising a closer distance position (A4) and a farther distance position (A3), the closer distance position (A4) being closer to the camera body (1) of the stereophotogrammetry device than the farther distance position (A3) to the camera body (1) of the stereophotogrammetry device.

Ex. 1020, 11:42–57.

F. Instituted Grounds of Unpatentability

We instituted trial based on the following grounds of unpatentability, which are all the grounds of unpatentability raised in the Petition:

Claim(s) Challenged	35 U.S.C. § ¹	Reference(s)/Basis
1–4, 8–11, 15, 16, 20	103	Plassmann, ² Treuillet, ³ Staller ⁴
12	103	Plassmann, Treuillet, Staller, Kingslake ⁵
21–23	103	Plassmann, Treuillet, Staller, Peng ⁶

Pet. 5, 28–81. Petitioner submits in support of its arguments the Declaration of Gerhardt Paul Otto, Ph.D. (Ex. 1003) and the Supplemental Declaration of Gerhardt Paul Otto, Ph.D. (Ex. 1053). Patent Owner submits in support of its arguments the Declaration of Dr. Daniel van der Weide (Ex. 2006), the Second Declaration of Dr. Daniel van der Weide (Ex. 2013), and the Declaration of Dr. Jean-Philippe Thirion (Ex. 2019).

II. LEVEL OF ORDINARY SKILL IN THE ART

To determine whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). In assessing the level of ordinary skill in the art, various factors

¹ The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. § 103 that became effective on March 16, 2013. Because the ’253 patent issued from an application having an effective filing date after March 16, 2013, we apply the AIA version of the statutory basis for unpatentability.

² WO 2010/097572 A2, published Sept. 2, 2010 (Ex. 1007).

³ Sylvie Treuillet, et al., *Three-Dimensional Assessment of Skin Wounds Using a Standard Digital Camera*, IEEE Transactions on Medical Imaging, Vol. 28, No. 5 at 752 (2009) (Ex. 1016).

⁴ US 7,257,322 B2, issued Aug. 14, 2007 (Ex. 1006).

⁵ Rudolf Kingslake, *A History of the Photographic Lens*, Academic Press Inc. (1989), (selected portions filed as Ex. 1028).

⁶ Qi Peng et al., *Automated 3D Scenes Reconstruction Using Multiple Stereo Pairs from Portable Four-Camera Photographic Measurement System*, International Journal of Optics, Vol. 2015 (2015) (Ex. 1009).

may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citing *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962–63 (Fed. Cir. 1986)). “[O]ne or more factors may predominate.” *Id.*

Petitioner argues that one of ordinary skill in the art “would have had a working understanding of photography, stereophotogrammetry, and distance measuring in photography or stereophotogrammetry, a master’s degree with a scientific focus on subjects such as optics and/or image processing, with at least about three years of experience in the field of photography, and stereophotogrammetry, as well as image processing in these fields, or an equivalent qualification.” Pet. 15 (citing Ex. 1003 ¶¶ 17–20).

Patent Owner argues that one of ordinary skill in the art “would have a Bachelor’s degree in Physics or Electrical Engineering or a similar field and two to three years of experience, including in image processing and computer graphics.” PO Resp. 23 (citing Ex. 2013 ¶¶ 30–32). Patent Owner adds that “Petitioner’s assertion of a higher level . . . is incorrect.” *Id.*

The parties do not substantively address the differences in their proposed definitions for one of ordinary skill in the art. Pet. Reply. 8; PO Resp. 23; *see generally* PO Sur-reply. Moreover, the parties agree that which definition we adopt does not substantively impact our analysis of the parties’ arguments concerning unpatentability. Tr. 29:19–30:9, 75:20–25.

Because Patent Owner’s definition of the level of skill in the art is consistent with the ’253 patent and the asserted prior art, we adopt it for purposes of this Final Written Decision. *See Okajima v. Bourdeau*, 261 F.3d

1350, 1355 (Fed. Cir. 2001); *GPAC*, 57 F.3d at 1579; *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978). In addition, we do not find sufficient support in the record for requiring one of ordinary skill in the art to have had a master's degree. Compare Ex. 1003 ¶ 20 (requiring a master's degree), with Ex. 2013 ¶ 31 (testifying why a master's degree was unnecessary). Our analysis herein, however, does not turn on which of the parties' definitions we adopt.

III. CLAIM CONSTRUCTION

Because the Petition was filed after November 13, 2018, we apply the same claim construction standard that would be used in a civil action under 35 U.S.C. § 282(b), following the standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b); 83 Fed. Reg. 51,340, 51,340–41, 51,343 (Oct. 11, 2018). In applying such standard, claim terms are generally given their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art, at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

Petitioner states that it “does not believe express constructions are required for any terms.” Pet. 16 (citing Ex. 1003 ¶ 62); Tr. 28:13–16 (Petitioner agreeing that the claim terms have their plain and ordinary meaning); Pet. Reply 1. Patent Owner likewise argues that the claim terms should have their plain and ordinary meaning. PO Sur-reply 1.

However, the parties dispute the scope of the plain and ordinary meaning of “two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views according to two different angles,” as recited in claim 1. PO Resp. 1–23; Pet. Reply 1–8; PO Sur-reply 1–9. Thus, we address the parties’ arguments to resolve this dispute. *See Eon Corp. IP Holdings v. Silver Spring Networks*, 815 F.3d 1314, 1318 (Fed. Cir. 2016) (finding that disputes between the parties over the plain and ordinary meaning of a term should be resolved as a matter of claim construction).

The gravamen of the parties’ dispute is what “different angles” refers to in the context of this limitation. According to Patent Owner, “different angles” refers to the orientation of the optical axis of each sub-optic. *E.g.*, PO Resp. 5–7. Specifically, Patent Owner argues that the limitation excludes configurations where the sub-optics’ optical axes are in parallel because the two views would be acquired at the same angle. *E.g.*, *id.* In contrast, Petitioner argues that “different angles” refers to the sub-optics viewing a *subject* from different angles, such as when the sub-optics are spaced apart—parallel configurations are not excluded. *E.g.*, Pet. Reply 1.

We address in detail the parties’ arguments below, starting with the intrinsic evidence.

A. Claim Language

Patent Owner argues that the language of the claims “does not mention light ‘from the subject’ or ‘object to be imaged,’ much less angles at which light is received from different points on a subject/object.” PO Resp. 19 (citing Ex. 2013 ¶ 101). “Rather, the ‘two different angles’ limitation defines an intrinsic characteristic of the sub-optics, *i.e.*, how they are ‘configured’” or angled, according to Patent Owner. *Id.* (citing Ex. 2013 ¶ 100).

We disagree with Patent Owner. Rather, we conclude that the claim language does not mean that the sub-optics' optical axes are angled, but instead means that the sub-optics each view a subject from a different angle, as Petitioner argues. Ex. 1020, 11:43–45; Pet. Reply 7. Specifically, this limitation recites that the two sub-optics are “configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1020, 11:43–45. Notably, “according to two different angles” directly follows “two views,” rather than directly following “configured.” *Id.* And “view” means “[a] scene or an arrangement of subject material for a photograph,” according to a technical dictionary provided by Patent Owner. Ex. 2014,⁷ 210 (defining “view”). In other words, the term “view” itself refers to viewed subject material—a target subject.

In addition, we find unavailing Patent Owner's argument that “the ‘subject’ is claimed only in connection with the ‘positioning system (34)’ ‘configured to signal when a target subject (S) is reaching[] . . . pre-defined distance positions (A3, A4) of the target subject (S) relative to the camera body (1).” PO Resp. 19 (citing Ex. 1020, 11:46–51; Ex. 2013 ¶ 102). Again, the term “view” implicates the subject. Ex. 2014, 210.

We also find unavailing Patent Owner's argument that the claims “disclose configuring the sub-optics according to ‘two different angles’ as a prerequisite to ‘pre-defining’ the ‘positions (A3, A4) of the target subject (S),’ as further claimed, and locating the subject at such positions within the two views.” PO Resp. 19–20 (citing Ex. 2013 ¶ 103); *see also id.* at 20 (arguing that dependent claims also support this argument). This argument

⁷ Leslie Stroebel & Hollis N. Todd, *Dictionary of Contemporary Photography* (1974).

is inapposite, and does not exclude parallel sub-optics. Rather, as Patent Owner acknowledges, conventional stereophotogrammetry devices can include parallel sub-optics “configured (spaced) to acquire two views,” and provide a stereoscopic binocular area where “the parallel views intersect to form stereo-pairs that can be reconstructed into three-dimensional representations.” PO Resp. 5–6; Ex. 2013 ¶ 67; Ex. 2015,⁸ 90. Hence, positions (A3, A4) can be predefined distances for the target subject S within that stereoscopic binocular area.

We likewise find unavailing Patent Owner’s argument that “the ‘two different angles’ limitation has nothing to do with the angles at which the sub-optics receive light from a subject, but rather defines the space within which the subject must be located to be imaged in the first place.” PO Resp. 20 (citing Ex. 2013 ¶ 100); PO Sur-reply 2. This argument also is inapposite, and does not indicate that the claimed sub-optics’ axes are not in parallel, as Patent Owner argues. Rather, the space within which the subject must be located can be the stereoscopic binocular area. Ex. 2015, 90; PO Resp. 4.

We also find unavailing Patent Owner’s argument that because “[d]isplaced sub-optics may be configured to acquire two views at the same angle, or at ‘two different angles,’” “construing ‘two different angles’ to mean any displaced sub-optics would read the ‘two different angles’ limitation out of the claims.” PO Resp. 22 (citing Ex. 2013 ¶ 107); PO Sur-reply 5 (making same argument). Rather, we conclude that “according to two different angles,” in the context of the limitation, is needed to claim a stereophotogrammetry device. Put differently, we agree with Petitioner and

⁸ Richard W. Kroon, *3D A-to-Z, An Encyclopedic Dictionary* (2012).

conclude that claim 1 does not otherwise recite that the two sub-optics are spaced, such as in a conventional stereophotogrammetry device. Ex. 1020, 11:42–57; Pet. Reply 7 (citing Ex. 1053 ¶ 31).

Although the preamble for claim 1 recites “[a] device for stereophotogrammetry,” “[g]enerally, the preamble does not limit the claims.” Ex. 1020, 11:42; *Georgetown Rail Equip. Co. v. Holland L.P.*, 867 F.3d 1229, 1236 (Fed. Cir. 2017) (citation omitted). We also are persuaded by Petitioner’s argument that “the preamble here is not limiting, because the body of the claim provides a complete description of the device.” Pet. Reply 7 (citing *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997)). Hence, “two different angles” is not read out of the claims, but rather serves to claim a stereophotogrammetry device (e.g., by requiring spacing of the sub-optics).

Regardless, as Petitioner notes, no “canon of claim construction is absolute in its application and [] some surplusage may exist in some claims.” Pet. Reply 7 (quoting *Decisioning.com, Inc. v. Federated Dep’t Stores, Inc.*, 527 F.3d 1300, 1312 (Fed. Cir. 2008)). And we view the phrase “configured for a simultaneous acquisition of two views according to two different angles” as referring to a stereophotogrammetry device, regardless of whether every word is needed to convey it.

In addition, we find unavailing Patent Owner’s argument that Petitioner makes new arguments concerning viewing the subject from different angles and the preamble not being limiting. PO Sur-reply 1 & n.1. Simply put, these arguments from Petitioner involve issues related to claim construction regarding the scope of the plain and ordinary meaning of this limitation, which was raised by Patent Owner in its Response. Petitioner is allowed to respond. *See Consolidated Trial Practice Guide* (November

2019)⁹ (“CTPG”), 45 (“The petitioner may respond to any such new claim construction issues raised by the patent owner.”).

B. The '253 Patent Specification

The parties each argue that the '253 patent Specification supports their arguments for the plain and ordinary meaning of this limitation. More specifically, Patent Owner argues that Figures 2–5 support that the sub-optics are oriented to have non-parallel (i.e., inwardly angled) optical axes. *E.g.*, PO Resp. 6. Patent Owner illustrates this position by annotating Figure 2 of the '253 patent. PO Resp. 18. We reproduce Patent Owner's annotated figure below.

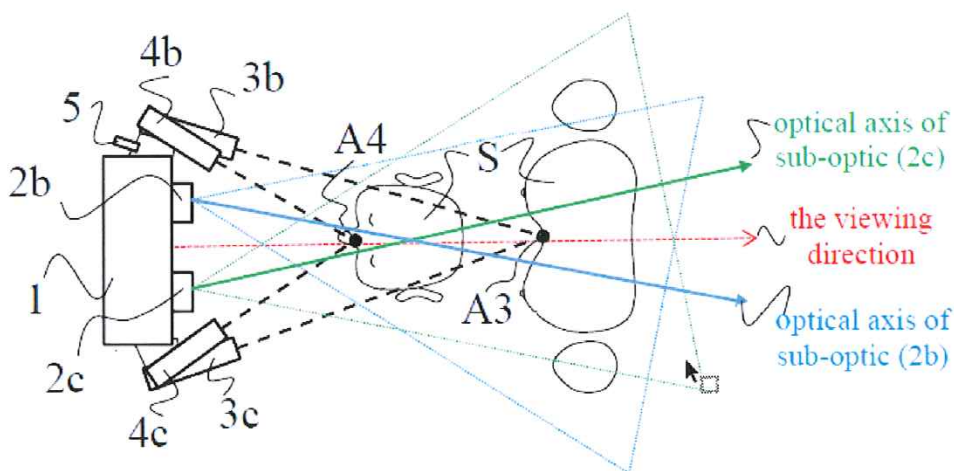


Figure 2 “represent[s] a possible implementation of the device viewed from the top.” Ex. 1020, 3:55–56. Patent Owner annotates Figure 2 by coloring the pyramid extending from sub-optic 2b blue and coloring the pyramid extending from sub-optic 2c green. PO Resp. 18. Patent Owner also adds a solid blue arrow and a solid green arrow from each sub-optic to the point where it perpendicularly bisects the respective base of each respective

⁹ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

pyramid. *Id.* Patent Owner labels each of these arrows as the “optical axis” of the respective sub-optic. *Id.* Patent Owner also adds a dotted arrow from the midpoint between the sub-optics through the centerpoint of an illustrated face and torso, and labels the arrow “the viewing direction.” *Id.*

We agree with Patent Owner that Figures 2–5 illustrate pyramid-shaped views acquired by the sub-optics where the pyramids are inwardly angled (rather than being perpendicular to the device’s plane). Ex. 1020, Figs. 2–5. The Specification indicates that all of these figures illustrate *possible* or *exemplary* implementations. *See, e.g., id.* at 3:55–59 (stating that Figures 2 and 3 each illustrate a “possible implementation”); 9:37–38 (stating that Figure 4 is an “exemplary device”); 9:45–46 (stating that Figure 5 is an “exemplary device”). Thus, the Specification does not indicate that having non-parallel optical axes for the pyramids is essential to the invention; the Specification never even uses the term “optical axis.” To the contrary, the Specification broadly provides that “[t]he double optics of the stereophotogrammetry device can be manufactured in different ways without impacting the functionality of the invention, provided that it is characterized by an increased depth of field.” *Id.* at 4:25–28.

Moreover, the Specification repeatedly refers to the different angles of the sub-optics relative to the viewed subject. *See, e.g.,* Ex. 1020, 4:14–17 (referring to “double optics enabling the acquisition of two simultaneous views with different angles *of the subject*”) (emphasis added), 4:30–33 (referring to “double optics” using “secondary mirrors each receiving one image *of the subject* with a slightly different angle”) (emphasis added); Pet. Reply 7 (citing Ex. 1053 ¶¶ 33–34).

In addition, we find unavailing Patent Owner’s arguments directed to problems identified in the Background of the Specification and the

advantages of the '253 patent. PO Resp. 10–15. For example, Patent Owner argues that the '253 patent discloses that portable stereophotogrammetry devices previously developed included “a single, nominal distance for picture taking which is optimized either for the face or for breast, but not optimized for both applications at the same time.” PO Resp. 9 (quoting Ex. 1020, 3:16–20; citing Ex. 2013 ¶ 73). Patent Owner adds that the '253 patent “ties the ‘two different angles’ limitation to overcoming the problem in the prior art and achieving the advantage of the invention” (i.e., a single stereophotogrammetry device for both distances). *Id.* at 10 (citing Ex. 1020, 3:33–36); *see also id.* (citing Ex. 1020, 4:30–33, 8:35–38; Ex. 2013 ¶ 76) (making same argument).

According to Patent Owner, however, if the sub-optics are configured for parallel views the field of view at point (A4) in Figure 2 “is too small to image the face and would not achieve the ‘advantage of the invention,’ *i.e.*, ‘a single portable stereophotogrammetry system . . . enabling the 3D reconstruction of the head . . . and . . . torso.’” PO Resp. 15 (quoting Ex. 1020, 8:19–26; citing Ex. 2013 ¶¶ 56, 87). These arguments are unavailing. Rather, we agree with Petitioner and find that “[s]imply moving the subject further from the camera would place the face” within the intersection of the parallel view pyramids. *See* Pet. Reply 4–6; Ex. 1053 ¶ 29. As can be seen for the version of Figure 2 modified by Patent Owner to show parallel view pyramids, a sufficient field of view for the face and torso is within the binocular area if the subject is moved further from the camera. *See* PO Resp. 14 (modifying Ex. 1020, Fig. 2); *see also* Ex. 1053 ¶ 29 (testifying that moving further away “[i]f no other changes were made, . . . would slightly lower the 3D resolution of the surface captured by the

device compared to using angled frustums,” “[h]owever, in this application area a slight decrease in resolution is acceptable”).

In sum, we find that the ’253 patent Specification does not limit the plain and ordinary meaning of this limitation so as to exclude sub-optics having parallel optical axes.

C. Prosecution History

We now turn to the prosecution history of the ’119 patent, which is the parent of the ’253 patent. Ex. 1020, code (63). The prosecution history “can often inform the meaning of the claim language by demonstrating how the inventor understood the invention.” *Phillips*, 415 F.3d at 1317. Such is the case here.

In particular, Patent Owner treated the “according to two different angles” language differently during prosecution than it does now. During prosecution, the Examiner rejected the challenged claims over Hoffmeier¹⁰ and concluded that Hoffmeier disclosed a stereophotogrammetry device comprising “two sub-optics (2b) and (2c) . . . configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1002 (’119 patent File History), 63–66; Ex. 1053 ¶ 12; Pet. Reply 1–3. Hoffmeier’s Figure 3 depicts its device and illustrates two views of its subject in its Figure 4. Ex. 1005 ¶¶ 25–26; Ex. 1053 ¶ 13. We reproduce these two figures side by side below.

¹⁰ US 2011/0175987 A1, published July 21, 2011 (Ex. 1005).

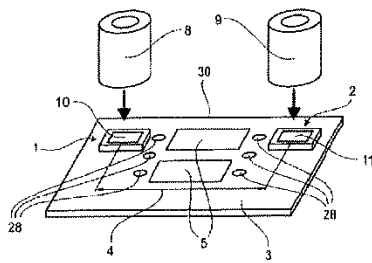


FIG. 3

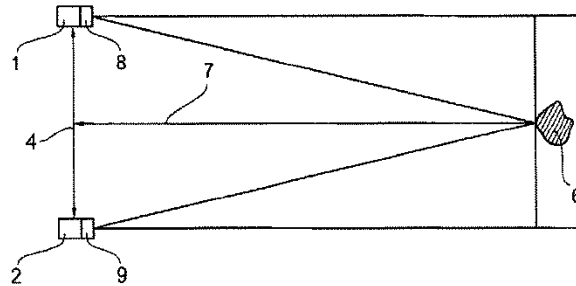


FIG. 4

Ex. 1005, Figs. 3–4. Figure 3 is a perspective view of the Hoffmeier system. *Id.* ¶ 25. Figure 4 shows a schematic structure of a stereo camera system with the Hoffmeier stereo camera system board. *Id.* ¶¶ 10, 26. The evidence supports that Hoffmeier’s lenses face forward in parallel rather than at an angle. *Id.* at Figs. 3–4, ¶ 35 (“The two optical systems 8, 9 can be coupled to the board 3 such that the respective optical axis of an optical system 8, 9 runs through the center point of the image sensing area 10, 11 of an image detection sensor 1, 2”); *see also* Ex. 1053 ¶ 14 (Petitioner’s expert opining that Hoffmeier’s Figure 4 “shows components 8 and 9 as having parallel axes”).

During prosecution, Patent Owner’s Chief Executive Officer (“CEO”), Dr. Jean-Philippe Thirion, who also is the named inventor for the ’119 and ’253 patents, submitted a response to the Examiner’s rejection. Ex. 1002, 88–107; Ex. 2019 ¶ 8. Notably, in that submission, Patent Owner admitted that Hoffmeier teaches claim 1’s “two different angles” recitation as follows:

Being devoid of any positioning system external to the stereovision system itself makes Hoffmeier quite different from the invention described in ’981 [(referencing the ’981 application that led to the ’119 patent)]. Hoffmeier therefore discloses “*A device for stereophotogrammetry comprising a camera body (1) and a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views*

according to two different angles” as in claim 1 of ’981, but it is all that Hoffmeier discloses relative to claim 1 of ’981.

Ex. 1002, 92 (bold emphasis added). Patent Owner further admitted that “8 and 9 in FIG 3 of Hoffmeier exactly correspond to 2b and 2c in FIG 2 of [the ’119 patent].” *Id.* at 91–92.

Patent Owner’s admissions during prosecution suggest to the public that Patent Owner understood that spaced optics with parallel optical axes fall within the scope of the disputed limitation. Patent Owner now downplays these admissions by arguing that Hoffmeier “is ambiguous as to whether the optical axes of 8, 9 are angled inwards, or are parallel.” PO Sur-reply 8. Any ambiguity does not help Patent Owner’s current position. Rather, despite the purported ambiguity, Patent Owner admitted that Hoffmeier taught “two views according to two different angles.” Ex. 1002, 92. The prosecution history, thus, suggests that the orientation of Hoffmeier’s optical axes is not important to whether the “two different angles” recitation is met. As such, Patent Owner’s prosecution history statements align with the present arguments of Petitioner, not Patent Owner.

D. Parallel Litigation

During district court litigation involving the ’119 patent, Patent Owner responded to Petitioner’s invalidity allegations regarding the Plassmann reference by agreeing that Plassmann teaches the now disputed “according to two different angles language.” Ex. 1037 (Patent Owner Response to Invalidity Chart), 2; *see also* Pet. Reply 6. Specifically, Patent Owner stated the following: “QuantifiCare agrees that the quoted language and figure include, *inter alia*, a double-optics comprising two sub-optics configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1037, 2.

Patent Owner now disputes that Plassmann teaches this recitation. *See, e.g.*, PO Resp. 27–30 (arguing that Petitioner’s contention that Plassmann acquires “two views according to two different angles” is incorrect). Thus, Patent Owner’s position in the district court litigation was consistent with its position during prosecution but inconsistent with its position in the current proceeding.¹¹ Thus, this inconsistency at least somewhat weighs against Patent Owner’s arguments.

In addition, we find unavailing Patent Owner’s argument that its agreement was subject to an objection that Petitioner failed to identify specifically where in Plassmann the limitation was taught. PO Sur-reply 9 (Ex. 1037, 2). Petitioner, however, clearly identified Plassmann’s Figure 1B and a passage describing it, which is the same structure Petitioner relies on here. Ex. 1037, 2.

We also find unavailing Patent Owner’s argument that this issue was raised belatedly by Petitioner. PO Sur-reply 8. As we discuss above, Petitioner may make this argument because it relates to issues of claim construction Patent Owner raises in its Response. CTPG, 45.

E. Summary

In view of the record as a whole, the weight of the evidence supports that claim 1’s “two views according to two different angles” language does not require that the optical axis of each sub-optic be angled differently, but instead requires only that the sub-optics view the subject from different

¹¹ Patent Owner argues that this extrinsic evidence should be disregarded. PO Sur-reply 8–9. We disagree. Although the extrinsic evidence is entitled to less weight, it nonetheless bolsters the intrinsic evidence establishing that Patent Owner—outside of the instant proceeding—understood “two views according to two different angles” means what Petitioner contends it means.

angles. Put differently, we conclude that this disputed limitation covers configurations of the two sub-optics that are spaced, regardless of whether the sub-optics' optical axes are orientated in parallel.

IV. PRINCIPLES OF LAW

"In an [inter partes review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring inter partes review petitions to identify "with particularity . . . the evidence that supports the grounds for the challenge to each claim")). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

A claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time of the invention to a person having ordinary skill in the art. *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of non-obviousness, if present. *See Graham*, 383 U.S. at 17–18. When evaluating a claim for obviousness, we also must "determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

V. OBJECTIVE INDICIA OF NONOBVIOUSNESS

Objective indicia of nonobviousness may include long-felt but unsolved need, failure of others, unexpected results, commercial success, copying, licensing, industry praise, and expert skepticism. *Mintz v. Dietz & Watson, Inc.*, 679 F.3d 1372, 1379 (Fed. Cir. 2012). Objective indicia are only relevant to the obviousness inquiry if there is a nexus between the claimed invention and the objective indicia of nonobviousness. *In re Affinity Labs of Tex., LLC*, 856 F.3d 883, 901 (Fed. Cir. 2017). A rebuttable presumption of nexus applies only “when [a patent owner] shows that the asserted objective evidence is tied to a specific product and that product ‘embodies the claimed features, and is coextensive with [the claims].’” *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (quoting *Polaris Indus. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1072 (Fed. Cir. 2018)). On the other hand, a patent owner is not entitled to a presumption of nexus if the patented invention is only a component of a commercially successful machine or process. *Id.* (reaffirming the importance of the “coextensiveness” requirement).

Applying *Fox Factory*, the Board uses a two-step analysis in evaluating nexus between the claimed invention and objective evidence of nonobviousness, also referred to as secondary considerations. *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 33 at 33 (PTAB Jan. 24, 2020) (precedential). We first consider whether Patent Owner has demonstrated “that its products are coextensive (or nearly coextensive) with the challenged claims,” resulting in a rebuttable presumption of nexus. *Id.* at 33. If not, that “does not end the inquiry into secondary considerations”; “the patent owner is still afforded an opportunity to prove nexus by showing that the evidence of secondary considerations is the ‘direct result of the unique

characteristics of the claimed invention.” *Id.* (quoting *Fox Factory*, 944 F.3d at 1373–75). For the reasons discussed below, we find that Patent Owner does not demonstrate (i) that its product is coextensive with the challenged claims for a presumption to attach, and (ii) the requisite nexus with evidence that the secondary considerations are the direct result of the unique characteristics of the claimed invention.

A. Presumption of Nexus

Patent Owner argues that “its LifeViz Infinity (‘Infinity’) product is disclosed and claimed in the patent.” PO Resp. 55 (citing Ex. 2013 ¶ 213). Patent Owner argues that Petitioner “does not dispute this assertion.” *Id.* (citing Pet. 81). “Therefore, nexus of secondary considerations regarding the Infinity to the invention is presumed,” according to Patent Owner. *Id.* (citing *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1330 (Fed. Cir. 2016)).

We disagree. Patent Owner does not provide an analysis demonstrating that its Infinity product is coextensive (or nearly coextensive) with the challenged claims. Rather, Patent Owner cites to the following testimony of Dr. van der Weide: “I have reviewed the LifeViz Infinity device and conclude that it embodies the invention of the [’]253 Patent. More specifically, the Infinity possesses all the features listed in claim 1 of the patent.” *Id.* (citing Ex. 2013 ¶ 213). Simply put, Patent Owner fails to provide any analysis whatsoever. *Id.*; *see also* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”).

Moreover, Patent Owner’s reliance on *WBIP* is misplaced. In that case, “WBIP presented evidence that specific products . . . [we]re embodiments of the invention as claimed in the asserted claims,” and that

provided a basis for finding a presumption of nexus. *WBIP*, 829 F.3d at 1329–31. Such is not the case here.

In sum, Patent Owner does not provide the required analysis demonstrating that Infinity is coextensive (or nearly coextensive) with the challenged claims. PO Resp. 55; *Lectrosonics*, Paper 33 at 33. We, therefore, find that a presumption of nexus is inappropriate.

B. Direct Result of the Unique Characteristics of the Claims

For the second step of our analysis, we look to whether Patent Owner demonstrates the requisite nexus with evidence that any secondary considerations are the direct result of the unique characteristics of the claimed invention. In particular, we address below Patent Owner’s arguments directed to the secondary considerations of (i) commercial success, (ii) copying, (iii) long-felt need, and (iv) praise for the invention. PO Resp. 55–66.

1. Commercial Success

For the commercial success indicia to support nonobviousness, Patent Owner needs “to show both commercial success and that a nexus exists between that success and the merits of the claimed invention.” *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1350 (Fed. Cir. 2012). We start with the latter of these requirements and look to Patent Owner’s arguments that a nexus exists between the purported commercial success and the challenged claims.

First, Patent Owner argues that “[a] nexus between sales of Infinity and the claimed invention is presumed because Infinity ‘is the invention disclosed and claimed in the patent.’” PO Resp. 61 (citing *WBIP*, 829 F.3d at 1330). We find this argument unavailing because as we find above,

Patent Owner does not demonstrate that a presumption should attach. *See supra* Section (V)(A).

We also find unavailing Patent Owner’s argument that “customers have identified claimed features as important to their use of the invention.” PO Resp. 61 (citing PO Resp. 59–60 (arguing that the claimed invention has received praise)). This argument does not address whether any sales, for example, of the Infinity product were owed to the merits of the claimed invention, nor that such purported praise lead to actual demand.

We also find unavailing Patent Owner’s argument that “Infinity sales were due to claimed features of the invention, *e.g.*, its ‘dual-distance’ functionality, which permitted customers to avoid buying multiple products or a non-portable multi-head system to accomplish the same tasks – as was noted by the EuroMediCom press release.” PO Resp. 62 (citing Ex. 2020,¹² 4). The announcement identifies the Infinity product as “BEST AESTHETIC DEVICE,” and describes the product, but does not evidence any specific demand for, or sales of, the Infinity product due to any features of the challenged claims. *See* Ex. 2020, 4. Nor does Patent Owner sufficiently address whether dual-distance functionality comprises the unique characteristics of the claimed invention.

We also find unavailing Patent Owner’s argument that “[t]he primary functional difference between [Petitioner’s] H2 and H1 [products] is that H2 can image the body (at a different distance) in addition to the face,” and that “[i]t follows that the large differential in production of the H2 as compared

¹² *Winners 2018-2019*, EuroMediCom (Jan. 29, 2021)
<https://www.euromedcom.com/mca-2018/en/trophy/Winners-2018-2019.html>.

to H1 is due to that additional functionality.” PO Resp. 62 (citing Ex. 2034¹³ (arguing that Vectra H1 images face only); Ex. 2030¹⁴ (arguing that Vectra H2 captures a face or body image). Patent Owner provides no evidence for why this purported differential in production occurred; rather, Patent Owner speculates.

Second, we do not find that Patent Owner demonstrates commercial success of the Infinity product. To establish commercial success, Patent Owner relies on a declaration from its CEO, Dr. Thirion. PO Resp. 61–64 (citing Ex. 2019 ¶¶ 29–37). Although Dr. Thirion provides evidence of increasing sales of Infinity, Dr. Thirion does not give any specific information about unit sales, revenue, or the Infinity’s market share relative to the greater medical imaging market. Ex. 2019 ¶¶ 29–37.

In addition, we find unavailing Patent Owner’s argument that Petitioner “does not contest that its H2 infringes, and thus its sales are relevant to the invention’s commercial success.” PO Sur-reply 25 (citing *Truswal Sys. Corp. v. Hydro-Air Eng’g, Inc.*, 813 F.2d 1207, 1215 (Fed. Cir. 1987) & n. 12 (citing Ex. 2013 ¶¶ 215–219). We find insufficient support for Patent Owner’s assertion that Petitioner does not contest infringement. And we find Patent Owner’s reliance on *Truswal* misplaced. First, we note that Patent Owner cites to Judge Rich’s dissent in *Truswal*. Second, Judge Rich stated the “once an infringer is sued *and proved to be an infringer*, its sales are appropriately proved and added to the others,” and that “[i]t is necessary to establish that the alleged copies are actual infringements of the patent in suit before they can possibly be relevant and counted as successes

¹³ *Vectra H1 Quick Reference Guide*, Canfield (2014).

¹⁴ *Vectra H2: Capturing a FACE or BODY image*, Canfield.

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of the patented invention.” *Truswal*, 813 F.2d at 1215 (Rich, J., dissenting).
Petitioner, as of now, has not been proved to infringe.

In sum, we find that Patent Owner does not show sufficient nexus between the purported commercial success and the claimed invention, and fails to show commercial success.

2. Copying

Patent Owner argues that Petitioner’s Vectra H2 “is a copy of *the invention*, in structure, function, operation, and use.” PO Resp. 64–66 (emphasis added). Patent Owner goes on to argue that Petitioner’s Vectra H2 mimics patented features and Infinity’s use of red and green light beamers. *Id.* at 64. Patent Owner emphasizes that Petitioner launched its H2 device “[e]ighteen months after Quantificare launched its Infinity.” *Id.* Based on these allegations, it is unclear whether Patent Owner alleges that Petitioner copied Patent Owner’s patent disclosure, subject matter of Patent Owner’s patent claims, or Patent Owner’s Infinity device.

Petitioner argues that it did not copy Patent Owner’s invention and identifies technical distinctions between the parties’ products. Pet. Reply 29–30. Petitioner’s expert, Dr. Otto, credibly opines that Petitioner’s choice of red and green light beamers was made for functional reasons (it is easier to get bright LEDs in red and green than in other colors). *Id.* (citing Ex. 1053 ¶¶ 80–81).

Here, Patent Owner lacks any evidence that Petitioner copied the ’253 patent or any claim of the ’253 patent. Patent Owner cites no evidence, for example, that Petitioner was aware of the ’253 patent during development of the H2 device. Patent Owner further lacks evidence that any particular aspect of the ’253 patent was copied. *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995) (“[M]ore than the mere fact of copying by an accused

infringer is needed to make that action significant to a determination of the obviousness issue.”) (citation omitted).

Patent Owner also lacks evidence that Petitioner copied any patented product. As we explain above, Patent Owner lacks evidence that the Infinity product is coextensive or nearly coextensive with any challenged claim; the record, thus, does not establish that Infinity is a “patented product” in a relevant sense.

Moreover, the Federal Circuit has held that “copying requires evidence of efforts to replicate a specific product, which may be demonstrated through internal company documents, direct evidence such as disassembling a patented prototype, photographing its features, and using the photograph as a blueprint to build a replica, or access to the patented product combined with substantial similarity to the patented product.” *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010). Here, Patent Owner lacks evidence that Petitioner studied any Patent Owner product or documents when developing the H2 device. To the contrary, the preponderance of the evidence supports that Petitioner’s H2 product differs from Patent Owner’s product, including because it refocuses at different distances (a design present in prior art systems). Ex. 1053 ¶¶ 79–81; *see also* Pet. Reply 29.

Thus, based on the record as a whole, Patent Owner’s allegation of copying is unpersuasive and does not support non-obviousness.

3. *Long-Felt Need*

Patent Owner argues that there was a long-felt need which the invention of the ’253 patent addresses. PO Resp. 55–59; PO Sur-reply 26. First, Patent Owner argues that in 2007, it “developed and launched the LifeViz stereophotogrammetry camera,” which “was a portable, handheld,

single camera device with one pair of beamers converging at the focus distance of the camera, and subjects were imaged at that distance.” PO Resp. 57 (citing Ex. 2019 ¶¶ 9–12).

Second, Patent Owner argues that “[a]t the time of invention [of the ’253 patent], there were no portable, ‘all-in-one’ handheld stereophotogrammetry devices for imaging both face and breast/torso.” *Id.* at 58 (citing Ex. 2019 ¶¶ 25–26, 29). “To image both, practitioners had to purchase one device for face and one for breast/torso, or purchase the large, costly multi-head Canfield XT,” which had disadvantages,” according to Patent Owner. *Id.* (citing Ex. 2019 ¶¶ 25–26, 29; Ex. 1001, 1:49–52).

Patent Owner argues that “[a]ccordingly, since at least the 2007 introduction of LifeViz, there was a long-felt need for a portable single-camera stereophotogrammetry device that avoided the disadvantages of purchasing multiple devices or a multi-head device like the Canfield XT.” *Id.* (footnote omitted) (citing Ex. 2013 ¶ 212; Ex. 2019 ¶ 30; Ex. 2020, 4).

“To address that deficiency, [Patent Owner] developed Infinity in 2015, filed for a patent thereon on October 14, 2015, and began commercial sales one year later,” according to Patent Owner. *Id.* at 59 (citing Ex. 2019 ¶¶ 28–29). Patent Owner argues that its Infinity product satisfied the long-felt need as demonstrated by industry praise and commercial success. *Id.* (citing Ex. 2019 ¶ 30; Ex. 2020, 4). Patent Owner also cites for support Dr. Otto’s deposition testimony that “it ‘was desired to do breast imaging,’ there was ‘a big demand’ to image ‘both areas,[]’ and [Petitioner] ‘didn’t want to have a separate product to do breast imaging.’” PO Sur-reply 26 (citing Ex. 2037, 17:22–18:17).

We find that Patent Owner does not show that there was a long-felt need that the claimed invention addresses. “[L]ong-felt need is analyzed as

of the date of an articulated identified problem and evidence of efforts to solve that problem.” *Texas Instruments Inc. v. U.S. Int’l Trade Comm’n*, 988 F.2d 1165, 1178 (Fed. Cir. 1993). Patent Owner does not show that the LifeViz product having only one pair of beamers converging at one distance was identified as a problem needing solution in 2007. *See* Ex. 2019 ¶¶ 9–12. Rather, Dr. Thirion testifies to the capabilities of the 2007 LifeViz product. *Id.* That a later generation product, such as Infinity, has additional capabilities does not evidence that a long-felt need existed and was met. Rather, evidence must be provided that shows there was an articulated identified problem and efforts to solve that problem, which Patent Owner does not do. Nor does Patent Owner provide evidence that Infinity was met with skepticism or that persons of ordinary skill in the art tried and failed to achieve the claimed invention.

Nor are we persuaded that industry praise and commercial success alone is sufficient to evidence a long-felt need that the claimed invention addresses. Both can exist without a long-felt need having existed. *See* Ex. 2019 ¶ 30 (testifying that Infinity created a new market for sales, but not providing direct evidence that a long-felt need had existed in the industry); Ex. 2020, 4 (stating that Infinity “is the first portable 3D imaging system capable of capturing face, body, and breast areas thanks to two sets of dual beamer pointers which allow for two distance settings,” but without stating it met a long-felt need). Furthermore, Dr. Otto’s deposition testimony cited by Patent Owner does not evidence that there was a long-felt need that the claimed invention solved. Ex. 2037, 17:22–18:17.

In sum, we find that Patent Owner does not show that there was a long-felt need. Moreover, Patent Owner does not provide analysis to show

the requisite nexus between the purported long-felt need and the unique characteristics of the claimed invention.

4. *Praise*

Patent Owner argues that Infinity won a prestigious award, the 2018 EuroMediCom Best Aesthetic Device Award, and that this award establishes industry praise. PO Resp. 59. In addition, Patent Owner argues that this award has nexus with the invention. *Id.* To that end, Patent Owner quotes three portions of the EuroMediCom announcement, and argues that “[t]his praise is squarely directed to the claimed invention.” *Id.* at 59–60 (citing Ex. 2020, 4; Ex. 2013 ¶ 214).

Below we produce the entirety of the announcement, and we italicize the portions Patent Owner quotes in its Response.

The LifeViz® Infinity is the first portable 3D imaging system capable of capturing face, body, and breast areas thanks to two sets of dual beamer pointers which allow for two distance settings. This unique system has two acquisition modes. A tripod mounted camera and turntable quickly capture a 360° 3D body image. Eight images are automatically taken and seamlessly stitched to produce a “life-like[”] 3D image of the body for visualization by the physician and patient. In hand-held mode, the camera is capable of generating 3D images of face and breast to simulate procedures and photo-document before/after interventions, without blocking an entire exam room with cumbersome equipment.

With a simple flip of a switch, dual beam pointers adjust to the distance ideal for face or body applications without the need for cumbersome repositioning and/or multi-headed systems. Superior image quality has been achieved by improving the optic performance. The LifeViz® Infinity produces excellent pictures from both near and far thanks to an increased deep field of view. Finally, a powerful external flash removes the need for specific lighting conditions and additional equipment ensuring reproducible images from one session to the next. The LifeViz® Infinity is comprised of a portable stereovision camera, a

software suite including an image database, 3D viewer tool, 3D skin analysis, face, breast, and body measurements and simulation modules. All aspects of 3D documentation, comparison, simulation, and measurement ranging from medical to cosmetic applications are possible with this single unique device.

Ex. 2020, 4 (*italics emphases added*). As can be seen above, the announcement broadly describes the Infinity product, including many additional features that Patent Owner does not identify, such as “a tripod mounted camera and turntable”; “[e]ight images are automatically taken and seamlessly stitched to produce a ‘life-like’ 3D image of the body for visualization”; “a powerful external flash”; and “a software suite including an image database, 3D viewer tool, 3D skin analysis, face, breast, and body measurements and simulation modules.” *Id.*

Patent Owner does not show that the purported praise is a direct result of the unique characteristics of the claimed invention. The announcement touts additional features of Patent Owner’s Infinity product. Based on the announcement, we cannot assess whether praise for Patent Owner’s product is grounded in a claimed feature, or other features, or a combination thereof. Patent Owner does not directly compare the announcement with the challenged claims, and does not clearly identify what Patent Owner contends are the unique characteristics of the claimed invention being praised. Moreover, the challenged claims are of varying scope, and Patent Owner does not address those differences.

In addition, Patent Owner argues that three “medical professionals’ praise is directed to the claimed invention.” PO Resp. 60–61 (citing

Ex. 2021,¹⁵ 11, 19–20). In particular, Patent Owner quotes from Dr. Lee’s testimonial that “[a]lthough regular 2D pictures are inconvenient, capturing a face or body in 3D with the 3D LifeViz® Infinity is easier. First of all, you have a unique device for standardized photography with a switch that adjusts the ideal distance for face and body.” *Id.* at 60 (citing Ex. 2021, 19). Patent Owner does not relate this portion of Dr. Lee’s testimonial to the claims, and fails to show that the purported praise is a direct result of the unique characteristics of the claimed invention.

In addition, Patent Owner quotes from the testimonial of Dr. Karimi who states that Infinity is “a state of the art, easy to use photographic system that has become an essential part of our consultation for face and body procedures.” *Id.* at 60 (citing Ex. 2021, 20). And Patent Owner argues that “Dr. Myriam Fopp uses LV Infinity for face (‘Wrinkles, Pores’) and body” and Dr. Fopp states that “[w]e also use our LifeViz® Infinity technology for body treatments.” *Id.* at 60 (citing Ex. 2021, 11). As above, Patent Owner does not relate these portions of Drs. Karimi’s and Fopp’s testimonials to the claims, including failing to show that the purported praise is a direct result of the unique characteristics of the claimed invention.

In sum, we find that Patent Owner does not show sufficient nexus between the purported praise and the claimed invention.

VI. ALLEGED OBVIOUSNESS OVER PLASSMANN, TREUILLET, AND STALLER

Petitioner argues that the combination of Plassmann, Treuillet, and Staller renders claims 1–4, 8–11, 15, 16, and 20 of the ’253 patent obvious. Pet. 5, 28–62. We have reviewed the parties’ arguments and the evidence of

¹⁵ *Testimonials: What our customers say*, QuantifiCare
<https://www.quantificare.com/learn/testimonials/>.

record, including the indicia of non-obviousness arguments. For the reasons that follow, we determine that Petitioner shows by a preponderance of the evidence that the combination of Plassmann, Treuillet, and Staller renders these claims obvious.

A. Summary of Plassmann

Plassmann is a World Intellectual Property Organization publication that relates to an apparatus for the production of stereoscopic images. Ex. 1007, at codes (10), (19), (57). Plassmann describes variations of the “MAVIS” system. *Id.* at 11:25–28. Plassmann’s apparatus captures “two images [which are] needed to form a stereo image . . . to produce a three-dimensional representation of the subject.” *Id.* at 12:25–29. The apparatus further includes two light emitting diodes (LEDs) emitting respective beams which converge at a particular distance in front of the apparatus. *Id.* at 12:7–13.

Below, we reproduce Plassmann Figures 1A and 1B.

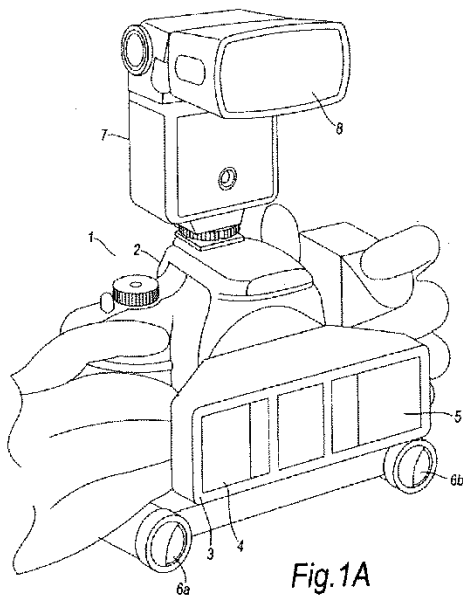


Fig. 1A
PRIOR ART

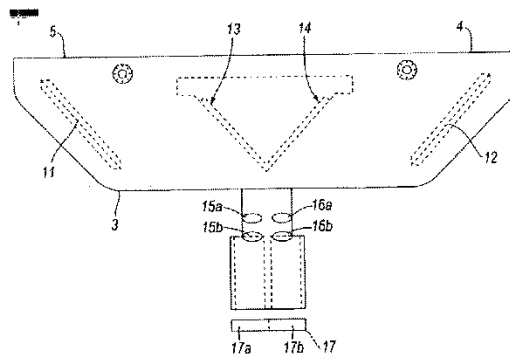


Fig. 1B
PRIOR ART

Figure 1A is a perspective representation of an apparatus for obtaining stereoscopic images, showing body 2 (e.g., a camera) and adaptor 3. *Id.* at 11:3–4, 11:28–12:4. Further Figure 1B shows a “plan view” of adaptor 3 in further detail. *Id.* at 11:5–6, 12:13–14. Adaptor 3 has two apertures 4, 5 which respectively collect light which is respectively focused onto charge coupled device parts 17a, 17b, forming respective first and second images. *Id.* at 12:15–25. The first and second images form a stereo image used to produce a three-dimensional representation of a subject. *Id.* at 12:25–29.

Additionally, as shown in Figure 1A, the apparatus includes

two low-powered light emitting diodes (LEDs) 6a, 6b, each provided with a [focusing] lens to produce a beam of light and being arranged so that the beams converge and meet at a point a fixed and desired distance from the apparatus, this distance corresponding to the distance at which the camera lens is [focused].

Id. at 12:8–13. The converging beams act as “a guide to show distance between the apparatus and subject.” *Id.* at 16:12–14.

B. Summary of Treuillet

Treuillet is a paper that relates to an “approach to build 3-D models of skin wounds from color images.” Ex. 1016, 752. Treuillet explains that “[b]y taking two color images from different points of view, stereophotogrammetry allows the computation of the 3-D coordinates of numerous points on the skin lesion.” *Id.* at 754.

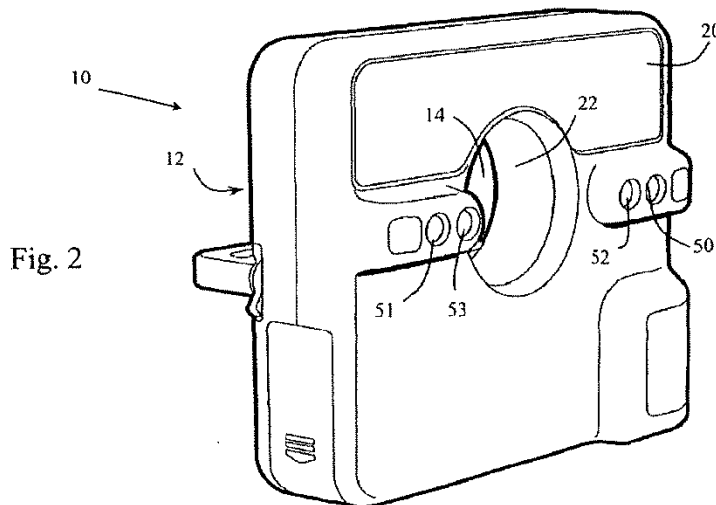
By way of imaging technology background, Treuillet describes the MAVIS II system as “a reflex digital camera equipped with special dual lens optics for recording two images from slightly different viewpoints, generating a stereo pair” which includes “two tube-shaped projectors produce beams of light which intersect in a single spot when the camera is

held at the right distance” at “about 80 cm from the wound,” with a tolerance of plus or minus 15 cm. *Id.* at 755.

C. Summary of Staller

Staller is a US patent that relates to a diffuser attachment for a camera including a “distance measurement device [that] uses a pair of light beams which intersect at a repeatable distance from the diffuser body to readily enable positioning of an object to be photographed at that repeatable distance.” Ex. 1006, code (57).

Below, we reproduce Figure 2, which shows a front perspective view of a diffuser. *Id.* at 3:13–14.



As shown in Figure 2, the diffuser “includes a distance measurement device or indicator in the form of a plurality of light beam emitters 50–53.” *Id.* at 5:13–15. “Each pair of emitters 50–51, 52–53 creates a pair of angled light beams which intersect at different distances in front of diffuser body 12.” *Id.* at 5:17–18. As such, “[e]ach of the pairs of light beams allows diffuser 10 to be relocated at the same repeatable distance from a subject.” *Id.* at 5:18–21;

see id. Fig. 4. That is, each pair of emitters indicates a different distance. *Id.* at 2:30–35, 5:64–6:2.

Further, either of the emitter pairs, i.e., pair 50–51 or pair 52–53, are selected using a selector switch. *Id.* at 5:38–41. By selecting a particular emitter pair, the distance measurement device indicates a particular distance measurement. *See id.*

D. Challenged Claim 1

1. Device for Stereophotogrammetry (Preamble)

Petitioner argues that Plassmann teaches “[a] device for stereophotogrammetry,” as recited in the preamble of claim 1. Pet. 28–29. More specifically, Petitioner argues that Plassmann teaches “a device for stereophotogrammetry including an adaptor (3) attached to a camera body (2) to capture stereo images.” *Id.* (citing Ex. 1007, Figs. 1A–1B; Ex. 1003 ¶ 229). Petitioner argues that “[t]he adaptor acquires two views of an object from two different angles via mirrors 11 and 12,” and that “Plassmann describes their use to reconstruct a 3-D representation of imaged objects.” *Id.* at 29 (citing Ex. 1007, 12:25–29). According to Petitioner, one of ordinary skill in the art “would understand Plassmann discloses a device for stereophotogrammetry.” *Id.* (citing Ex. 1003 ¶ 230).

After reviewing Petitioner’s arguments and evidence, which are not addressed by Patent Owner (*see generally* PO Resp.), we determine that Petitioner demonstrates by a preponderance of the evidence that Plassmann teaches claim 1’s preamble.

2. Camera Body

Petitioner argues that Plassmann teaches “a camera body (1),” as recited in claim 1. Pet. 29–30. More specifically, Petitioner argues that Plassmann teaches camera body 2. *Id.* (citing Ex. 1007, Fig. 1A; Ex. 1003

¶ 231). Petitioner adds that Plassmann teaches using “a camera body such as is well-known to those skilled in the art.” *Id.* at 30 (quoting Ex. 1007, 5:29–30, 12:3–4).

After reviewing Petitioner’s arguments and evidence, which are not addressed by Patent Owner (*see generally* PO Resp.), we determine that Petitioner demonstrates by a preponderance of the evidence that Plassmann teaches “a camera body (1).”

3. Double-Optics Comprising Two Sub-Optics

Claim 1 further recites “a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1020, 11:43–45. We agree with Petitioner and find that Plassmann teaches this limitation. Pet. 30–32.

Petitioner annotates Plassmann’s Figure 1B, which is shown below with Petitioner’s annotations. *Id.* at 31.

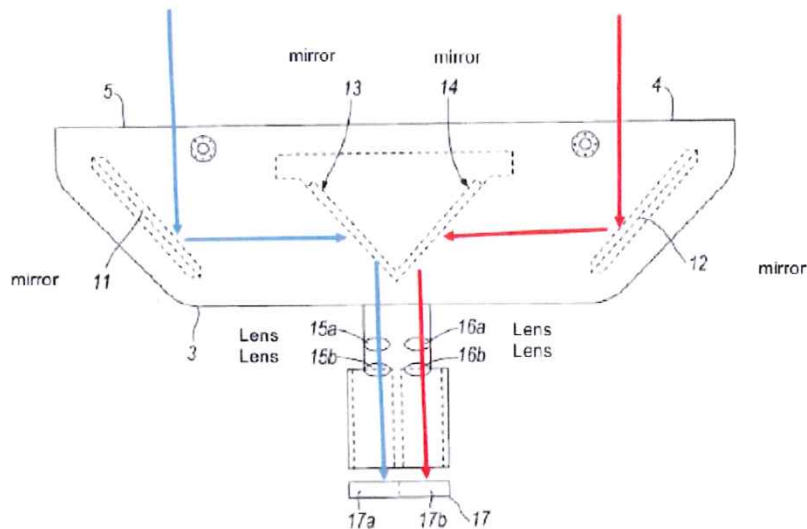


Fig.1B
PRIOR ART

Plassmann teaches that Figure 1B depicts “a plan view of a known adaptor used in” “a known apparatus for obtaining stereoscopic images.” Ex. 1007, 11:3–6. Petitioner annotates the figure with blue lines indicating an exemplary first light path through aperture 5 to charge coupled device part 17a, which Plassmann describes as follows: “Light passing through aperture 5 hits mirror 11 and then mirror 13 before passing through lenses 15a, 15b. Lenses 15a, 15b focus the light so that, when the shutter of the camera is pressed, light is focussed onto part 17a of a charge coupled device 17 so as to form a first image.” Pet. 30–31 (annotating Ex. 1007, Fig. 1B, citing 12:14–25); Ex. 1007, 12:15–20. Similarly, Petitioner annotates the figure with red lines indicating an exemplary second light path through aperture 4 to charge coupled device part 17b, which Plassmann describes as follows: “[L]ight passing through aperture 4 hits mirror 12 and then mirror 14 before passing through lenses 16a, 16b. Lenses 16a, 16b focus the light so that, when the shutter of the camera is pressed, light is focussed onto part 17b of the charge coupled device 17 so as to form a second image.” Pet. 30–31 (annotating Ex. 1007, Fig. 1B, citing 12:14–25); Ex. 1007, 12:20–25.

We agree with Petitioner and find that one of ordinary skill in the art would have recognized that the combination of mirrors and lenses comprises double-optics employing two sets of sub-optics (*i.e.* 11, 13, 15a, and 15b (blue) and 12, 14, 16a, and 16b (red)). Ex. 1007, 12:14–25, Fig. 1B ; Ex. 1003 ¶ 235; Pet. 32. More specifically, we agree with Petitioner and find that Plassmann teaches having two sub-optics, which are displaced from one another, and which each collect light from the subject to be imaged (viewed). *See, e.g.*, Ex. 1007, 12:14–25, Fig. 1B. Plassmann teaches that the light collected by each sub-optic comprises the light that passes through the respective aperture 4 or 5, and traverses different sets of mirrors and

lenses to be focused on a different part of a charged coupled device to form respective first and second images (views). *Id.* at 12:14–25, Fig. 1B.

We also agree with Petitioner and find that due to spaced mirrors 11 and 12—which are part of different light paths and which are hit by the light that passes through their respective aperture 4 or 5—the two images (views) are necessarily acquired at different angles. Ex. 1007, 12:14–25, Fig. 1B; Ex. 1003 ¶ 235; Pet. 32. Moreover, each sub-optic receives light from, for example, the center point of the object to be imaged from a different angle due to the spaced mirrors 11 and 12, as well as depending on the curvature of the subject and which point on the subject from which the light originates. *Id.*; *see also* PO Resp. 28 (admitting that “[i]t is true that, when a subject is imaged using a stereophotogrammetry device having two sub-optics, the ‘angle’ between a point of the subject and each sub-optic is different”).

In addition, the ’253 patent Specification describes the claimed double optics as follows: “A double optics (2) adapted to the camera body (1) and composed of two sub-optics (2b) and (2c), enabling the acquisition of a stereo pair corresponding to two slightly different viewing angles.” Ex. 1020, 8:35–38. Notably, the passage provides that having two sub-optics enables acquiring a stereo pair “corresponding to two slightly different viewing angles,” without addressing the sub-optics’ orientation. *Id.*

Lastly, we agree with Petitioner and find that because images (views) are captured using a single camera, one of ordinary skill in the art would have understood they are obtained simultaneously. Ex. 1003 ¶ 235.

We find unavailing Patent Owner’s arguments disputing that Plassmann teaches this limitation. PO Resp. 23–30. Patent Owner’s arguments are premised on its construction (which we do not adopt) of the plain and ordinary meaning for this limitation which excludes parallel view

sub-optic configurations. *Id.* Put differently, Patent Owner argues that having the sub-optics spaced apart from each other is insufficient to teach “two views according to two different angles.” *Id.* As we discuss above, this is incorrect. Thus, Patent Owner’s discussions regarding the optical axes of the sub-optics and their orientations are inapposite in light of the proper construction for “two views according to two different angles.” *Id.*

Moreover, we afford the testimony of Dr. van der Weide, Patent Owner’s expert, little weight with regard to this issue, as it is based on the incorrect claim construction for “according to two different angles,” and does not explain otherwise a basis for the testimony that the two images are acquired at the same angle. Ex. 2013 ¶¶ 113–141.¹⁶

In sum, we are persuaded that Petitioner demonstrates by a preponderance of the evidence that Plassmann teaches “a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views according to two different angles.”

4. *Wherein the Device is Comprising a Positioning System*

The remaining limitation of claim 1 reads as follows:

wherein the device is comprising a positioning system (34) configured to signal when a target subject (S) is reaching a pre-defined distance position to the camera (1) corresponding to one of at least two distinct pre-defined distance positions (A3, A4) of the target subject (S) relative to the camera body (1) of the stereophotogrammetry device, the at least two distinct predefined distance positions comprising a closer distance position (A4) and a farther distance position (A3), the closer

¹⁶ Petitioner argues that Plassmann and its Figure 3A suggest that its sub-optics are angled inwardly such that this recitation would be met “[e]ven if the Board were to exclude parallel suboptics from the claims.” Pet. Reply 8. It is not necessary to reach this issue because we did not adopt Patent Owner’s construction.

distance position (A4) being closer to the camera body (1) of the stereophotogrammetry device than the farther distance position (A3) to the camera body (1) of the stereophotogrammetry device.

Ex. 1020, 11:46–57. We agree with Petitioner and find that the combination of Plassmann, Treuillet, and Staller teaches this limitation. First, we agree with Petitioner and find that Plassmann teaches a positioning system that uses a pair of light beamers to signal when a target subject is reaching a predefined distance position to the camera. *See* Ex. 1007, Fig. 1A (light beamers 6a, 6b); Pet. 33. Plassmann teaches that light beams converge at a predefined distance “corresponding to the distance in which the camera lens is focussed.” Ex. 1007, 12:7–13. More specifically, Plassmann states the following:

The apparatus is also provided with two low-powered light emitting diodes (LEDs) 6a, 6b, each provided with a focussing lens to produce a beam of light and being arranged so that the beams converge and meet at a point a fixed and desired distance from the apparatus, this distance corresponding to the distance at which the camera lens is focussed.

Id.; Pet. 34. Accordingly, we find that Plassmann teaches the limitation, save for having a second predefined distance position—if there are two different distance positions, one necessarily is closer to the camera body and the other one farther. Ex. 1007, 12:7–13, Fig. 1A.

Second, we agree with Petitioner and find that Staller teaches a positioning system having more than one predefined imaging distance position. Pet. 38. More specifically, we find that Staller teaches a strobe diffuser attachment for a camera, which includes a “distance measurement device [that] may be adapted to selectively produce one of a plurality of pairs of light beams which intersect at different repeatable distances from the diffuser body.” Ex. 1006, code (57), 2:29–32, 5:13–15; *see also id.* at 5:56–

6:2 (“[T]wo pairs of light beam emitters . . . may be used to provide three or four separate pairs of intersecting bea[m]s and three or four corresponding repeatable distances for diffuser 10.”); Pet. 38. In other words, Staller teaches having at least two distinct predefined distance positions for the camera. Ex. 1006, code (57), 2:29–32, 5:13–15, 5:56–6:2.

We also agree with Petitioner and find that Staller teaches that its “distance indicator improves the usefulness of close range photography by providing a repeatable scale to photographs[, which] . . . improves the usefulness of close ranges photographs for medical and other organic growth measurement applications.” Ex. 1006, 6:10–15; Pet. 38. In addition, we agree with Petitioner and find that Plassmann teaches that “[s]tereoscopic imaging has been known for many years,” and “ha[s] been used to measure the shape of wounds and the like which are otherwise difficult to measure by conventional techniques.” Ex. 1007, 1:6–15; Pet. 35. We also agree with Petitioner and find that it was known in the art before the ’253 patent to use a camera having multiple predefined distances for imaging a subject in connection with wound or lesion treatment. *See* Ex. 1017,¹⁷ 579; Ex. 1011,¹⁸ 164, Fig. 2, Table 2; Ex. 1008,¹⁹ 481.

Thus, in light of the above, we find that one of ordinary skill in the art would have found it obvious to modify Plassmann’s stereophotogrammetry device, based on what was known in the art, which includes Staller’s

¹⁷ Gwen Clarke, *Recording Wounds: Polaroids New Medically Designed Camera*, British Journal of Community Nursing, vol. 5, no. 11 (Sept. 27, 2013) (“Clarke”).

¹⁸ Melvin A. Shiffman, *A New Camera for Cosmetic Surgery*, The Am. J. Cosmetic Surgery, vol. 15, no. 2 (June 1, 1998) (“Shiffman”).

¹⁹ Clare Williams, *Wound care assessment with the Polaroid Macro 3 SLR*, British J. Community Nursing, vol. 6, no. 9 (2001) (“Williams”).

teachings, to have multiple predefined distance positions for repeatability. Plassmann already teaches use of one pair of light beams for positioning, and a person of skill in the art would have understood that the Plassmann device could benefit from multiple pairs of light beams in the same way the Staller device benefits from the multiple pairs of light beams to enable positioning at more than one repeatable distance from the camera. Ex. 1003 ¶¶ 138–139; *KSR*, 550 U.S. at 417 (“[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.”).

We find unavailing Patent Owner’s arguments that Plassmann’s camera needs to be “optimally focused,” which occurs at a single fixed distance, and thus, one of ordinary skill in the art would not add a second distance. PO Resp. 31–36; PO Sur-reply 17–20 (making similar arguments that optimal focus to ensure precision and accuracy of the image of a wound).²⁰ We also find unavailing Patent Owner’s argument that Plassmann teaches “the distance at which the camera lens is focussed,” and thus, one of ordinary skill in the art would understand that Plassmann “refers to the

²⁰ Patent Owner refers to Exhibits 2039 and 2040 in its Sur-reply. Patent Owner used these exhibits (which Petitioner served on Patent Owner, but did not file in this proceeding) during a deposition of Dr. Otto, and filed them in this proceeding with its Sur-reply, which is late under our Rules. See Paper 41 (Order), 3 (authorizing refiling of exhibits to correct numbering, but stating that “this order does not address the merits of whether or not the exhibits at issue are proper”). We consider these exhibits in evaluating Dr. Otto’s testimony, but “not as evidence supporting [Patent Owner’s] arguments on the merits.” *Ascend Performance Materials Operations LLC, v. Samsung SDI Co.*, IPR2020-00349, Paper 53, at 12 (PTAB, July 15, 2021). Regardless, the disclosures in these exhibits do not change our depth of field analysis.

singular distance where the lens is optimally-focused.” PO Resp. 34–35 (quoting Ex. 1007, 12 (alteration in original); citing Ex. 2013 ¶ 152).

These arguments are contrary to the well-known concept of “depth of field.” As both parties’ experts and the ’253 patent acknowledge, depth of field is the region in which an image is focused or sharp. *See* Ex. 1003 ¶ 37 (quoting Ex. 1001, 6:15–16²¹) (“Like any camera, stereophotogrammetry devices employ lenses that provide a certain depth of field. This depth of field is ‘the distance separating the two planes within which the image is focused.’”); Ex. 2006 ¶ 47 (quoting Ex. 1020, 4:20–24) (“[T]he two predefined distances are included within . . . the space within which the image is sharp, that is . . . the depth of field.”). And Plassmann’s teaching of “the” distance refers to where the beams converge at the pre-defined distance where there is focus (i.e., within the depth of field), rather than limiting the depth of field to a single point of focus. Ex. 1007, 12 (“[T]he beams converge and meet at a point a fixed and desired distance from the apparatus, this distance corresponding to the distance at which the camera lens is focussed.”).

Moreover, stereophotogrammetry devices having sufficient depth of field were known in the art. Ex. 1003 ¶¶ 113, 115, 385; Pet. Reply 19; *see Randall Mfg. v. Rea*, 733 F.3d 1355, 1362–63 (Fed. Cir. 2013) (providing that it is appropriate to consider such knowledge as part of an obviousness analysis). For example, Treuillet teaches with respect to the MAVIS II stereophotogrammetry device that “[t]o simplify the image capture, two tube-shaped projectors produce beams of light which intersect in a single

²¹ Dr. Otto quotes from the Specification of the ’119 patent, which is the parent of the ’253 patent and shares a common Specification. In the ’253 patent, this passage is contained within lines 20–24 of column 4.

spot when the camera is held at the right distance (about 80 cm from the wound),” and that “[e]xact positioning is not required: images can be taken in a volume of ± 15 cm around this point.” Ex. 1016, 755. This teaching that exact positioning is not required, and that images can be taken within a 30 cm region evidences the depth of field for the MAVIS II. Ex. 1016, 755; Ex. 1053 ¶¶ 55–56.

We find unavailing Patent Owner’s argument that Treuillet’s teaching that the beams of light intersect at “the right distance” equates to “the distance of optimal focus or where the image is sharpest,” and limits the MAVIS II to using that distance. PO Resp. 36 (citing Ex. 1016, 755; Ex. 2013 ¶ 154). This teaching refers to reaching the pre-defined distance, rather than limiting the depth of field. Ex. 1016, 755. We also find unavailing Patent Owner’s arguments that Treuillet teaching that “images can be taken in a volume of ± 15 cm” does not teach a depth of field, and that “[c]an” is not “should.” PO Resp. 41–42 (citing Ex. 2013 ¶¶ 180–182). This teaching directly corresponds to what depth of field means and “can” expresses that capability of taking focused images within the depth of field. Ex. 1016, 755; Ex. 1003 ¶ 37; Ex. 2006 ¶ 47; Ex. 1001, 6:15–16; Ex. 1020, 4:20–24.

In addition, Hoeffelin²² teaches a stereophotogrammetry device having a 40 cm depth of field, which is sufficient to image both the face and torso. See Ex. 1015, 8–9 (disclosing “that the focal length needs to be respected (between 80 and 120 cm)”; Ex. 1003 ¶ 169; Ex. 1053 ¶ 61. We find unavailing Patent Owner’s argument that Hoeffelin teaches that “the

²² H. Hoeffelin, et al., *A Methodological Evaluation of Volumetric Measurement Techniques including Three-Dimensional Imaging in Breast Surgery*, BioMed Research Int’l, vol. 2014, 8 (Jan. 2014) (Ex. 1015).

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focal length needs to be respected,” or otherwise brings risk of distortion. PO Resp. 36–37 (citing Ex. 1015, 8–9; Ex. 2013 ¶ 156). Patent Owner ignores the “(between 80 and 120 cm)” range that immediately follows and modifies the focal length statement, and expresses a depth of field. Ex. 1015, 8–9.

Moreover, we find unavailing Patent Owner’s arguments to the extent that they focus only on Plassmann’s depth of field. *See* PO Resp. 31–36; PO Sur-reply 17–20. These arguments are directed to Plassmann’s teachings individually, which is the incorrect focus. *Cf. In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (“Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references”); *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). In addition, these arguments are akin to arguing that Plassmann and Treuillet’s teachings cannot be physically combined, which is an improper focus for determining non-obvious. *See Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (quoting *In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983)); *see also id.* (quoting *In re Etter*, 756 F.2d 852, 859 (Fed. Cir. 1985) (en banc)) (“Etter’s assertions that Azure cannot be incorporated in Ambrosio are basically irrelevant, the criterion being not whether the references could be physically combined but whether the claimed inventions are rendered obvious by the teachings of the prior art as a whole.”).

We also find unavailing Patent Owner’s argument that that there would be no reason to combine Staller’s teachings with Plassmann because Plassmann has no need for additional beamers to provide repeatable scale. PO Resp. 38. More specifically, Patent Owner argues that “with Plassmann, the scale of the 3D reconstruction is already known exactly from the

calibration and triangulation methodology,” and “[t]herefore, Plassmann already enables wound images to be viewed over successive examinations at repeatable scale(s) and at varying levels of magnification.” *Id.* (citing Ex. 2013 ¶ 165). Even if, as Patent Owner argues, one of ordinary skill in the art could develop or utilize different solutions to address scale, this does not make Staller’s solution less obvious. *Cf. Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (“[A] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.”). Moreover, the ability to consistently take images from different positions using multiple beamers would still have utility.

We also find unavailing Patent Owner’s argument that “Treuillet criticizes MAVIS II, calling it ‘cumbersome’ and stating ‘all the previous systems are unsuitable for general use in clinical settings.’” PO Resp. 43 (quoting Ex. 1016, 752, 755, 761). Patent Owner further argues that Treuillet criticizes that Plassmann’s MAVIS II requires “careful calibration.” *Id.* at 44. These arguments, however, do not undermine our finding above that a person having ordinary skill in the art would have understood that the MAVIS II device had a useable depth of field and that Plassmann would benefit from having multiple positioning beamers within that depth of field. Treuillet does not denigrate the notion of using multiple beamers with MAVIS II. *Cf. In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004) (“The prior art’s mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the [claimed solution].”).

In summary, we are persuaded that Petitioner (i) demonstrates by a preponderance of the evidence that the combination of Plassmann, Treuillet,

and Staller teaches this limitation, and (ii) provides sufficiently articulated reasoning with rational underpinning to support Petitioner's combining of Plassmann, Treuillet, and Staller's teachings for this limitation. *See Kahn*, 441 F.3d at 988 (citations omitted), *cited with approval in KSR*, 550 U.S. at 418.

5. *Summary*

In summary, we determine that Petitioner shows by a preponderance of the evidence that claim 1 would have been obvious to one of ordinary skill in the art in view of the combination of Plassmann, Treuillet, and Staller.

E. Challenged Claims 2–4, 8, 9, 15, 16, and 20

Petitioner argues that the combination of Plassmann, Treuillet, and Staller teaches the limitations recited in claims 2–4, 8, 9, 15, 16, and 20. Pet. 42–50, 58–62. Patent Owner's Response does not separately address Petitioner's arguments directed to these claims. PO Resp. 46.

Based on the evidence and arguments of record, we find that Petitioner demonstrates by a preponderance of the evidence that claims 2–4, 8, 9, 15, 16, and 20 would have been obvious to one of ordinary skill in the art over the combination of Plassmann, Treuillet, and Staller.

F. Challenged Claim 10

Claim 10 recites “[t]he device according to claim 1 wherein the closer distance position (A4) and the farther distance position (A3) are such that a surface of a field of view corresponding to the farthest distance position (A3) is at least 25% larger than a surface of a field of view corresponding to the closer point position (A4).” Ex. 1020, 12:53–58. To address this recitation, Petitioner argues that it would have been obvious to a person

having ordinary skill in the art to define a farther position 25% larger than the closer position. Pet. 51. Petitioner persuasively argues that Plassmann and Treuillet both disclose that Plassmann could be used for wound monitoring. *Id.* at 51–52. Petitioner also persuasively argues that a person of ordinary skill in the art would have understood that wound-monitoring devices could employ close and far positions which differ in magnification by more than 200%. *Id.* A preponderance of the evidence including the Clarke reference evidences this point. Ex. 1017, 579–80; Ex. 1003 ¶ 286.

Petitioner further argues a person having ordinary skill in the art would have also understood that a Plassmann-type stereophotogrammetry device could be used for imaging face or breasts. Pet. 52. A preponderance of the evidence also supports this position. The '253 patent acknowledges that separate stereophotogrammetry devices had been used for 3D reconstructions of face and breasts in A3 and A4 surface format. Ex. 1020, 1:46–59; Ex. 1003 ¶ 287.

Petitioner's expert, Dr. Otto, calculates that Plassmann's 30-centimeter depth of field would be sufficient to encompass a "surface field of view" equivalent to the A4 format and equivalent to the A3 format (different by more than 25%). Pet. 52–53 (citing Ex. 1003 ¶ 289). Dr. Otto also testifies that, while Plassmann and Treuillet do not disclose focal length of the Plassmann device's lenses, a person having ordinary skill in the art would understand that different lenses could be employed to achieve different results. *Id.* at 53 (citing Ex. 1003 ¶¶ 164–172, 291–292). Dr. Otto further explains that a person of ordinary skill would have known how to configure a Plassmann device to take both A3 and A4 formats within the depth of field of the Plassmann device. *Id.* at 53–54. Dr. Otto further explains that a person of ordinary skill would have understood that any

suitable lens could be used to achieve imaging goals. *Id.* at 53–54 (citing Ex. 1003 ¶ 290); *see also id.* (citing Ex. 1003 ¶¶ 164–172, 291–292).

Petitioner further argues that a person having ordinary skill in the art would have known that similar stereophotogrammetry devices could image face and bodies, such as the LifeViz II device. Pet. 54–55; Ex. 1014,²³ 2 (depicting images of faces and breasts using LifeViz II); Ex. 1003 ¶¶ 168, 292. Petitioner argues that Hoeffelin teaches that LifeViz II has a depth of field from 80–120 cm and that a person of ordinary skill in the art would have thus understood that a 40-centimeter depth of field would be sufficient to encompass A4 format and 100% larger A3 format. Pet. 55–56 (citing Ex. 1003 ¶¶ 170–171, 292; Ex. 1015, 8–9). Dr. Otto confirmed that such a device could encompass these formats. *Id.* at 56 (citing Ex. 1003 ¶¶ 171, 292).

Patent Owner argues that Otto’s analysis and conclusions are flawed. PO Resp. 46–54; PO Sur-reply 22–25. More specifically, Patent Owner argues, as Petitioner acknowledges, that neither Plassmann nor Treuillet disclose the actual focal length of the lenses, and Patent Owner argues that this means neither references teaches “field of view.” PO Resp. (citing Ex. 2013 ¶¶ 192–193; Ex. 1003 ¶ 290). Patent Owner, thus, emphasizes that Dr. Otto relies on replacing Plassmann’s lenses to reach A4 and A3 formats. *Id.* at 47.

Patent Owner then argues that Otto’s calculations and approach err because they are based on a single pyramidal view rather than considering, as necessary for stereophotogrammetry, the intersection of two separate view frustums. *Id.* at 48. Patent Owner’s witness, Dr. van der Weide,

²³ 3D LifeViz website (Jan. 31, 2014).

explains this purported error. Ex. 2013 ¶¶ 196–199. Patent Owner further argues that depth of field is controlled by lens aperture and that Dr. Otto could not evaluate Plassmann’s depth of field without lens aperture dimensions. PO Resp. 49–50 (citing Ex. 2013 ¶ 200).

Patent Owner also argues that, even under Dr. Otto’s calculations, the subject would have to be imaged 64.5 cm from the camera which is outside of the 65–95 cm depth of field Dr. Otto calculates. *Id.* at 50 (citing Ex. 1003 ¶ 164; Ex. 2013 ¶ 201).

Patent Owner also disputes that Petitioner and Dr. Otto correctly contend that LifeViz II could image the face and torso. *Id.* at 50–53. Patent Owner emphasizes that the face image is from a QuantifiCare advertisement while the torso image is from Hoeffelin, which uses a different camera. *Id.* (citing Ex. 1014, 1–2; Ex. 1015, 2–4; Ex. 2013 ¶¶ 204–205; Ex. 2019 ¶¶ 20–24). Patent Owner further argues that Hoeffelin only provides focal length rather than depth of field. PO Resp. 53 (citing Ex. 1005, 8–9; Ex. 1015, 4; Ex. 2013 ¶ 206).

Patent Owner then argues that, because of Dr. Otto’s analytic errors, Petitioner has not shown that modified devices would meet claim 10 or that a person having ordinary skill in the art could determine how to modify the devices with a reasonable expectation of success. *Id.* at 54.

Considering all of evidence before us, the preponderance of the evidence supports that a person having ordinary skill in the art would have had reason to configure Plassmann as claim 10 recites (to be able to take both face and breast stereo-photos) and would have understood how to employ suitable lenses and focus distances to achieve claim 10’s field of view. We find Dr. Otto’s testimony credible and Petitioner’s position persuasive based on the evidence the Petition cites.

In particular, the preponderance of the evidence suggests that a person of skill in the art would have known the benefit of creating stereophotogrammetric 3-D images of both faces and breasts. *See* Ex. 1020, 1:56–59 (disclosing a specialist creates images of faces and breasts); Ex. 1014, 2 (suggesting that LifeViz device can create 3-D face image); Ex. 1015, 3 (suggesting LifeViz device can create 3-D breast images). The preponderance of the evidence further supports that a person having ordinary skill in the art would have known that the device described by Plassmann and Treuillet could be configured to create these images with a reasonable expectation of success by making use of various lenses, focal lengths, depths of field, and so forth to define closer and farther imaging positions as desired and, in particular, to reach the recitations of claim 10 for face and breast imaging. Pet. 54; Ex. 1003 ¶ 172; Ex. 1053 ¶¶ 69–74.

Patent Owner’s argument that Dr. Otto miscalculates the precise adjustments that would allow such imaging (PO Resp. 46–55) do not undermine Petitioner’s rationale as to why a person having ordinary skill in the art would combine the references’ teachings to reach claim 10 or would have reasonable expectation of success reaching claim 10. As Petitioner points out, Patent Owner lacks evidence that would undermine Petitioner’s position that such a device would have been desired and achieving such a device would have been within the ordinary skill in the art. Pet. Reply 21. Thus, the preponderance of evidence as to this more general proposition remains true even if Patent Owner were correct that Dr. Otto’s precise calculations were in error. Petitioner does not have a burden to provide precise dimensions of an obvious device within the scope of claim 10. Rather, Petitioner needs to show that a person having ordinary skill in the art would have had both reason and reasonable expectation of success as to

reaching claim 10's recitations. As we explain above, Petitioner meets this burden.

In sum, we find that Petitioner demonstrates by a preponderance of the evidence that claim 10 would have been obvious to one of ordinary skill in the art over Plassmann, Treuillet, and Staller.

G. Challenged Claim 11

Claim 11 recites the following:

The device according to claim 1 wherein the field of view corresponding to the closer distance position (A4) is equal to a normalized surface format A4, that is 21 cm times 29.7 cm, with possible variation of plus or minus 40% of a surface of the normalized surface format A4 and the field of view corresponding to the farther distance position (A3) is equal to a normalized surface format A3, that is 29.7 cm times 42 cm, with possible variation of plus or minus 40% of a surface of the normalized surface format A3.

Ex. 1020, 12:59–67. For largely the same reasons as claim 10, Petitioner argues that it would have been obvious to a person having ordinary skill in the art to select a field of view that corresponds to A3 surface format and a second field that corresponds to A4. Pet. 56–58. Patent Owner argues that Petitioner does not meet its burden for the same reasons as claim 10. PO Resp. 55. As we explain above, the preponderance of the evidence supports Petitioner's position. *See also* Ex. 1003 ¶¶ 295–298 (Dr. Otto addressing claim 11).

In sum, we find that Petitioner demonstrates by a preponderance of the evidence that claim 11 would have been obvious to one of ordinary skill in the art over Plassmann, Treuillet, and Staller.

VII. ALLEGED OBVIOUSNESS OVER PLASSMANN,
TREUILLET, STALLER, AND KINGSLAKE

Petitioner argues, with specific cites to the record, that the combination of Plassmann, Treuillet, Staller, and Kingslake teaches the limitations recited in claim 12. Pet. 63–67. Patent Owner’s Response does not separately address Petitioner’s arguments directed to this claim. PO Resp. 67.

Based on the evidence and arguments of record, we find that Petitioner demonstrates by a preponderance of the evidence that claim 12 would have been obvious to one of ordinary skill in the art over the combined teachings of Plassmann, Treuillet, Staller, and Kingslake.

VIII. ALLEGED OBVIOUSNESS OVER PLASSMANN,
TREUILLET, STALLER, AND PENG

A. *Legal Sufficiency of the Petition*

Patent Owner argues that the Petition is legally deficient because in a related district court litigation Petitioner argued that claims 21–23 contained terms subject to Section 112(f), but Petitioner here fails “to inform the Board that Petitioner contends these terms are subject to Section 112(f), or provide constructions or identify the specific portions of the specification describing the corresponding acts.” PO Resp. 67–68; PO Sur-reply 29–30. Patent Owner argues that Petitioner thereby violates 37 C.F.R. § 42.104(b). PO Resp. 67–68.

Patent Owner’s arguments are unpersuasive. In this *inter partes* review, Petitioner argues that express construction is not necessary for any claim term. Pet. 16. This is sufficient under our Rules. *See* CTPG 44 (“[A] petitioner may include a statement that the claim terms require no express construction.”). Patent Owner does not identify any requirement that

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Petitioner must take a claim construction position in this proceeding that is identical to a position taken in a still pending district court litigation. An inconsistency, however, can weigh against an argument on how to construe a claim term. Here, however, Patent Owner does not argue that Section 112(f) actually should apply to any claim term.

In addition, we do not find persuasive Patent Owner's reliance on *Orthopediatrics Corp. v. K2M, Inc.*, IPR2018-01548, Paper 9, at 9–12 (PTAB Mar. 1, 2019). This Board decision is non-precedential and we find that under the facts here. For example, in *Orthopediatrics Corp.*, the construction of the term was in dispute, which is not the situation here as neither party argues Section 112(f) applies. Paper 9, at 9. And the petitioner in *Orthopediatrics Corp.* argued, *inter alia*, that its “petition is based on the claim constructions urged by Patent Owner in the related district court litigation,” but failed to “set forth Patent Owner's position in the related [d]istrict [c]ourt litigation.” *Id.* at 9–10.

In sum, we do not find that the Petition in this proceeding is insufficient under 37 C.F.R. § 42.104(b).

B. Challenged Claims 21 and 22

Petitioner argues, with specific cites to the record, that the combination of Plassmann, Treuillet, Staller, and Peng teaches the limitations recited in claims 21 and 22. Pet. 67–77. Patent Owner's Response does not separately address Petitioner's arguments directed to these claims. PO Resp. 67.

Based on the evidence and arguments of record, we find that Petitioner demonstrates by a preponderance of the evidence that claims 21 and 22 would have been obvious to one of ordinary skill in the art over the combined teachings of Plassmann, Treuillet, Staller, and Peng.

C. Challenged Claim 23

Petitioner argues that the combination of Plassmann, Treuillet, Staller, and Peng renders claim 23 obvious. Pet. 78–79. Claim 23 depends from claim 15, which depends from independent claim 1. Ex. 1020, 13:23–34, 14:49–15:5. Claims 15 and 23 are reproduced below.

15. A method comprising using the stereophotogrammetry device according to claim 1, comprising:

moving the stereophotogrammetry device (1) and a target subject (S) (200) so that the positioning system (34) signals that one of the at least two pre-defined distance positions between the camera (1) and the target subject (S) is reached, such signal being the superimposition of beamers on the target subject (S) or the emission of an electromagnetic, acoustic or any other type of signal; and

taking one or several stereo-pairs at the same pre-defined distance position (300).

23. The method according to claim 15 comprising selecting (100):

Either the closer distance position (A4), and then placing a face of a target subject (S) at the closer distance position, and then taking several stereo-pairs of the face of the target subject (S) at the closer distance position, processing these stereo-pairs to reconstruct 3-Dimensional surfaces of the face of the target subject (S), then matching these different 3-Dimensional surfaces in space and finally stitching together these different 3-Dimensional surfaces into a comprehensive 3-Dimensional surface representation (710) of the face of the target subject (S); or

the farther distance position (A3), and then placing a torso of a target subject (S) at the farther distance position, and then taking several stereo-pairs of the torso of the target subject (S) at the farther distance position, processing these stereo-pairs to reconstruct 3-Dimensional surfaces of the torso of the target subject (S), then matching these different 3-Dimensional surfaces in space and finally stitching together these different 3-

Dimensional surfaces into a comprehensive 3-Dimensional surface representation (720) of the torso of the target subject (S).

Id.

For claim 23, Petitioner relies on, *inter alia*, its arguments it made for certain of the other challenged claims, such as for claims 1, 10, 11, and 15. Pet. 78–79.

Patent Owner argues that Petitioner fails “to prove that [one of ordinary skill in the art] would create a device having surfaces of fields of view capable of imaging both the face and torso as per claim 23.” PO Resp. 69–70 (footnote omitted) (citing PO Resp. 46–54; Ex. 2013 ¶ 228). Patent Owner relies on its arguments for claims 10 and 11 for support.

We are not persuaded by Patent Owner’s arguments. In particular, we address above the parties’ arguments directed to claims 10 and 11, and find that Petitioner shows that the combination of Plassmann, Treuillet, and Staller renders claims 10 and 11 obvious. *See supra* Sections VI(F)–(G). We also find above that Petitioner has shown that claims 1 and 15 are rendered obvious. *See supra* Sections VI(D)–(E).

Accordingly, based on the evidence and arguments of record, we find that Petitioner demonstrates by a preponderance of the evidence that claim 23 would have been obvious to one of ordinary skill in the art over the combined teachings of Plassmann, Treuillet, Staller, and Peng.

IX. PATENT OWNER’S MOTION TO EXCLUDE

Patent Owner’s Motion to Exclude seeks to exclude two areas of evidence. We address each in turn.

A. Exclusion of Dr. Otto's Testimony to the Extent it Espouses and Relies on Inadmissible Hearsay

Patent Owner argues that testimony of Petitioner's witness, Dr. Otto, should be excluded to the extent Dr. Otto relies on statements regarding the depth of field of the MAVIS II system discussed in Treuillet because Treuillet's statements are hearsay and not the kinds of fact an expert would reasonably rely upon. Mot. Excl. 1–13. Patent Owner further argues that Treuillet's description of MAVIS II is inconsistent with Plassmann's writings concerning MAVIS II and should be excluded for this reason as well. *Id.* at 13–14.

Patent Owner's arguments for exclusion are unpersuasive for at least three reasons. First, as Petitioner argues in opposition to the motion to exclude, Treuillet is admissible as prior art. Opp. Mot. Excl. 2–3. Petitioner and Dr. Otto rely on Treuillet for what the Treuillet reference teaches to a person having ordinary skill in the art at the relevant time. Treuillet's suggestions to a person having ordinary skill in the art remain relevant even if Treuillet were factually incorrect in some respects.

Second, even if considered hearsay, Dr. Otto properly relied on Treuillet. Opp. Mot. Excl. 4–7. Under Federal Rule of Evidence 703, an expert may rely on facts and data that “need not be admissible,” including hearsay (double or otherwise). Here, the evidence supports that Treuillet was published in an independent, respected, and peer-reviewed IEEE journal. *Id.* at 5–6 (citing evidence regarding reliability of the IEEE journal). In addition, we find unavailing Patent Owner's arguments concerning “Reference 45.”²⁴ Mot. Excl. 3–5; Reply Mot. Excl. 1–5.

²⁴ Treuillet cited this reference as follows: “MAVIS II: 3-D wound instrument measurement Univ. Glamorgan, 2006 [Online].

Rather, we find that it is appropriate for an expert also to rely on the sourcing in article published in such an IEEE journal. Thus, Treuillet is the kind of evidence we would expect an expert witness or person having ordinary skill in the art to rely upon, and Dr. Otto was entirely reasonable on relying on Treuillet in forming his opinions.

Third, even if Treuillet were inconsistent with other evidence, such as Plassmann, this issue would go to the credibility of Dr. Otto's testimony and the weight given to it in deciding ultimate issues of fact rather than admissibility in the first instance.

For the reasons above, we deny Patent Owner's motion to exclude with respect to Dr. Otto's testimony.

B. Exhibits 1018, 1019, 1026, 1033, and 1034

Patent Owner seeks to exclude Exhibits 1018, 1019, 1026, 1033, and 1034 because "the Petition does not cite or otherwise rely on them." Mot. Excl. 15. Petitioner argues that it relied on Exhibits 1026, 1033, and 1034. Opp. Mot. Excl. 12.

In rendering our decision, we only consider Petitioner's evidence to the extent it is properly presented in the Petition or the Reply. We consider Petitioner's evidence that Dr. Otto cites only to the extent explanation of the evidence is properly presented in the Petition or the Reply or only for purposes of assessing whether Dr. Otto's testimony presented in the Petition or the Reply is well-grounded. As such, resolution of Patent Owner's motion to exclude with respect to these exhibits would have no affect our decision making.

Available: <http://www.imaging.research.glam.ac.uk/projects/wm/mavis/>." Ex. 1016, 762.

For the reasons above, we dismiss as moot Patent Owner's motion to exclude these exhibits.

X. PATENT OWNER'S OBJECTIONS TO PETITIONER DEMONSTRATIVES

Patent Owner objects to certain of Petitioner's demonstratives for oral argument because, for example, the demonstratives constitute evidence that Petitioner did not reference or discuss in a prior paper, according to Patent Owner. *See, e.g.*, PO Objs. 2. Patent Owner also objects to certain demonstratives as mischaracterizing the record. *Id.* at 1.

Demonstratives for oral argument are not evidence, and we do not rely on demonstratives as evidence in our decision making. Paper 45, 3. Because demonstratives are not evidence and we do not rely on them in making our decision, Patent Owner's objections to the demonstratives likewise do not affect our decision making and are therefore moot.

XI. CONCLUSION²⁵

Based on the full record, we determine that Petitioner shows by a preponderance of the evidence that (i) claims 1–4, 8–11, 15, 16, and 20 are unpatentable over Plassmann, Treuillet, and Staller; (ii) claim 12 is unpatentable over Plassmann, Treuillet, Staller, and Kingslake; and

²⁵ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

(iii) claims 21–23 are unpatentable over Plassmann, Treuillet, Staller, and Peng.

Claim(s)	35 U.S.C. §	Reference(s) /Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–4, 8–11, 15, 16, 20	103	Plassmann, Treuillet, Staller	1–4, 8–11, 15, 16, 20	
12	103	Plassmann, Treuillet, Staller, Kingslake	12	
21–23	103	Plassmann, Treuillet, Staller, Peng	21–23	
Overall Outcome			1–4, 8–12, 15, 16, 20–23	

XII. ORDER

In consideration of the foregoing, it is hereby

ORDERED that, pursuant to 35 U.S.C. § 314(a), Petitioner has shown by a preponderance of the evidence that claims 1–4, 8–12, 15, 16, and 20–23 of the '253 patent are unpatentable;

FURTHER ORDERED that Patent Owner's Motion to Exclude (Paper 46) is *denied* with respect to evidence addressed by Section IX.A, *supra*, and is *dismissed as moot* with respect to evidence addressed by Section IX.B, *supra*;

FURTHER ORDERED that Patent Owner's Objections to Petitioner's Demonstratives are *overruled*; and

FURTHER ORDERED that parties to the proceeding seeking judicial review of this Final Written Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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Paper 60
Date: March 17, 2023

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CANFIELD SCIENTIFIC, INC.,
Petitioner,

v.

QUANTIFICARE S.A.,
Patent Owner.

IPR2021-01519
Patent 10,681,334 B2

Before BRIAN J. McNAMARA, JOHN D. HARMANN, and
BRIAN D. RANGE, *Administrative Patent Judges*.

McNAMARA, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
Denying In Part and Dismissing In Part Patent Owner's Motion to Exclude
35 U.S.C. § 318(a)

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Patent 10,681,334 B2

I. BACKGROUND

On March 21, 2022 we instituted an *inter partes* review of claims 1–5, 9–12, 15, 16, and 20–23 of U. S. Patent No. 10,681,334 B2 (“the ’334 Patent”), from a Petition (Paper 1, “Pet.”) filed September 8, 2021. Paper 15 (“Dec. to Inst.”). Patent Owner filed a Patent Owner Response (Paper 20, “PO Resp.”), Petitioner filed a Petitioner Reply (Paper 29, “Reply”) and Patent Owner filed a Sur-reply (Paper 41, “Sur-reply”). Patent Owner also filed a Motion to Exclude (Paper 45, “Mot. to Excl.”), Petitioner filed an Opposition to Patent Owner’s Motion to Exclude (Paper 46, “Opp. Mot. Excl.”) and Patent Owner filed a Reply to Petitioner’s Opposition (Paper 52, “PO Reply to Opp.”). A transcript of an oral hearing held on December 14, 2022 (Paper 59, “H’rg. Tr.”) has been entered into the record.

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. §318(a). We base our decision on the preponderance of the evidence. 35 U.S.C. § 316(e) (2018); 37 C.F.R. § 42.1(d).

Having reviewed the arguments of the parties and the supporting evidence, we conclude that Petitioner has demonstrated by a preponderance of the evidence that all the challenged claims are unpatentable.

II. THE ’334 PATENT

The ’334 patent is titled “Device and Method to Reconstruct Face and Body in 3D.” Ex. 1022, code (54). The challenged patent relates to a stereophotogrammetry device used “to picture and reconstruct in 3D the surface of objects of different sizes,” e.g., different body parts such as the face and the torso. *Id.* at 3:42–43; *see id.* at 1:30–42, 1:60–67. By way of background, the ’334 patent explains that “[s]tereophotogrammetry consists in [simultaneously] gathering the images of a subject from at least two view

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with a calibrated camera,” i.e., a “stereo-pair.” *Id.* at 1:43–48. The stereo-pair is used to “reconstruct . . . a dense representation in 3-Dimensions of the surface of the observed object.” *Id.* at 1:49–51. The ’334 patent states that “the device and method according to the disclosure are specifically intended to acquire with a single portable stereophotogrammetry camera views of subjects at two distinct distances” for “reconstruction in 3D of comprehensive representation of the head on one side of the subject and of the torso on the other side of the subject” to meet the “needs of plastic surgeons and aesthetic dermatologists with a single and portable imaging device.” *Id.* at 11:43–50.

Figures 1 and 2, reproduced below, respectively show side- and top-views of an “implementation” of a stereophotogrammetry device and its components. *Id.* at 3:66–4:2.

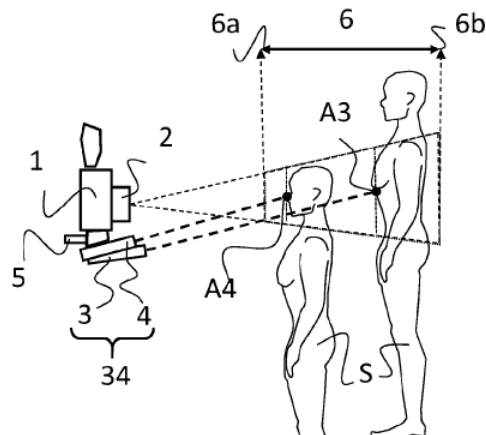


FIG. 1

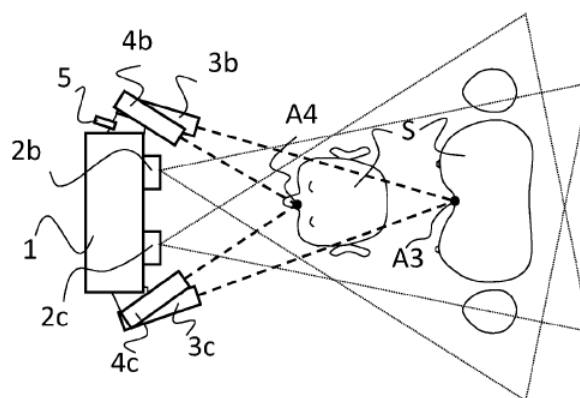


FIG. 2

In Figures 1 and 2, camera body (1) includes double optics (2). *Id.* at 8:43–44. As shown in Figure 2, double optics (2) are “composed of two sub-optics (2b) and (2c), enabling the acquisition of a stereo[-]pair [of images] corresponding to two slightly different viewing angles” simultaneously. *Id.* at 8:45–48; *see id.* at 3:28–31. For example, Figure 8 shown below shows a

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series of stereo-pair images taken at different angles for a face. *Id.* at 11:22–30.

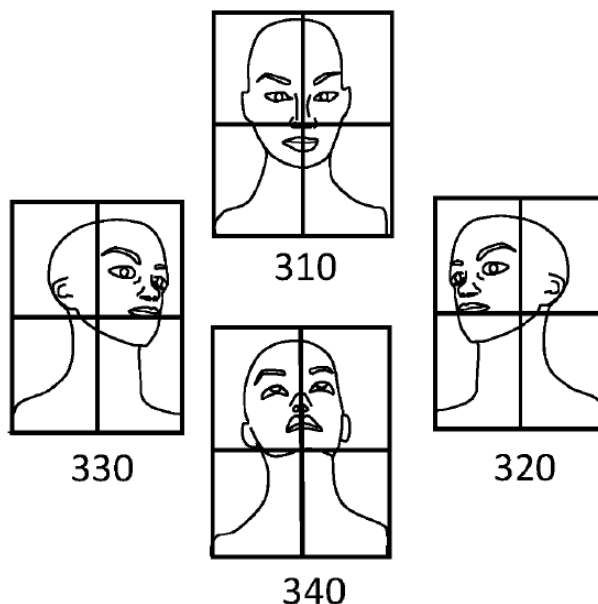


FIG. 8

The '334 patent specification describes Figure 8 as presenting “viewpoints optimized for imaging a face using a field of view close to an A4 surface format.” *Id.* at 4:17–18. Using the captured stereo-pairs, “a comprehensive representation in 3D of the surface of the subject (S)” can be constructed. *Id.* at 10:57–58.

Further, the stereophotogrammetry device captures stereo-pairs of images at “two distinct distances for picture taking corresponding respectively to position (A3) and (A4)” such that the stereo-pairs of images are in focus at positions A3 and A4, which are within the device’s depth of field 6. *Id.* at 8:48–59; *see id.* at 6:41–44. For example, position A3 is used for capturing images of the torso while position A4 is used for capturing images of the face. *Id.* at 6:22–30; *see id.* at 1:60–67. Positions A3 and A4 can be identified by the convergence of respective light patterns projected

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onto the subject to be imaged, the respective light patterns converging at the distances for positions A3 and A4—for example, as shown in Figure 2, a light pattern emitted by first pair of light beamers (3b) and (3c) converge at point (A3) and a different light pattern emitted by second pair of light beamers (4b) and (4c) converge at point (A4). *Id.* at 8:60–64; *see id.* at 4:64–5:3. Accordingly, “by placing the subject so that the light patterns projected by a first pair of beamers are superposed on the surface of the subject[,], one is placing the subject at” the first pre-defined position (and similarly for the light pattern emitted by the second pair of beamers converging at the second position). *Id.* at 4:67–5:2; *see id.* at 5:3–10.

Figure 8 illustrates that for the stereo pairs acquired at distance A4 for the face of subject S, it is advantageous to take a first view 310 from the front of the face, a second view 320 from the side of the face, a third view 330 from the other side and slightly under the face, and a fourth view from the front and slightly under the face. *Id.* at 11:23–20. Figure 9 illustrates a similar approach for acquiring images of a torso at distance A4. *Id.* at 11:31–42.

III. ILLUSTRATIVE CLAIM

Claim 1 is representative of the subject matter claimed in the '334 patent. Claim 1 is reproduced below using paragraph designations from the Petition.

1. [1.01] A device for stereophotogrammetry configured for an acquisition of two views according to two different angles, said acquisition generating a pair of images, with one image corresponding to one of the two views and the other image corresponding to the other of the two views, this pair of images being referred to as a stereo-pair,

[1.02] wherein the device is further comprising a positioning system (34) configured to signal when a target subject (S) is

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reaching one of at least two distinct pre-defined distance positions (A3, A4) relative to the stereophotogrammetry device, the at least two distinct predefined distance positions comprising a closer distance position (A4) and a farther distance position (A3), the closer distance position (A4) corresponding to the target subject (S) being closer to the stereophotogrammetry device and the farther distance position (A3) corresponding to the target subject (S) being farther to the stereophotogrammetry device.

IV. GROUNDS OF INSTITUTION

We instituted trial on the following all ground asserted in the Petition, in particular:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–5, 9–12, 15, 16, 20	103	Plassmann ¹ , Treuillet ² , Staller ³
21–23	103	Plassmann, Treuillet, Staller, Peng ⁴

V. CLAIM CONSTRUCTION

Petitioner submits that no express constructions are required to evaluate the issues raised in the Petition, except for the following terms:

(1) *device for stereophotogrammetry configured for an acquisition of two views according to two different angles* and (2) *a positioning system*

¹ WO 2010/097572 A2, *Method and Apparatus for Stereoscopic Imaging and Adaptor Therefor*, published September 2, 2010 (Ex. 1007).

² S. Treuillet, B. Albouy and Y. Lucas, *Three-Dimensional Assessment of Skin Wounds Using a Standard Digital Camera*, IEEE Transactions on Medical Imaging, vol. 28, no. 5, pp. 752–762, May 2009 (Ex. 1016).

³ U.S. Patent No. 7,257,322, *Photographic Strobe Diffuser*, issued August 14, 2007 (Ex. 1006).

⁴ Qi Peng, Lifen Tu, Kaibing Zhang, Sidong Zhong, *Automated 3D Scenes Reconstruction Using Multiple Stereo Pairs from Portable Four-Camera Photographic Measurement System*, International Journal of Optics Volume 2015 (August 17, 2015) (Ex. 1009).

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configured to signal when a target subject (S) is reaching one of at least two distinct pre-defined distance positions (A3, A4) relative to the stereophotogrammetry device. Pet. 15–20.

A. *Positioning system configured to signal when a target subject (S) is reaching one of at least two distinct pre-defined distance positions (A3, A4) relative to the stereophotogrammetry device*

In our Decision to Institute, we noted that both parties agree that this term reciting a positioning system should be construed as a means plus function limitation subject to the provisions of 35 U.S.C. § 112(f). Dec. to Inst. 12–13. We adopted Petitioner’s proposal that “[t]he recited function is signaling when a target subject is reaching one of at least two distinct pre-defined distance positions relative to the stereophotogrammetry device” and a person of ordinary skill “would not recognize the phrase to refer to any specific structure.” *Id.* (citing Pet. 19) (alteration in original). Petitioner also states that “[i]f signaling includes the superimposition of two light beams on the subject, then the specification identifies structure including at least two pairs of light beamers for performing that function.” Pet. 19 (citing Ex. 1022, 4:64–5:7). Patent Owner does not dispute Petitioner’s proposed construction, and the proposed construction is consistent with claim language and the ’334 Specification. Thus, we apply this construction for purposes of this Decision.

B. *device for stereophotogrammetry configured for an acquisition of two views according to two different angles*

1. *Introduction*

Challenged independent apparatus claim 1 and dependent apparatus claims 2–5 and 9–12 recite a “device for stereophotogrammetry.” Apparatus claim 3 depends from claim 1 and further limits the device to a portable system. Ex. 1022, 12:10–11. No apparatus claim depends directly or

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indirectly from claim 3. Challenged method claims 15–16, 20 recite methods of using the device recited in claim 1 (*see* claim 15), claim 5 (*see* claim 16), and claim 9 (*see* claim 20). Claims 21 and 23 depend from method claim 15. “[T]he presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim.”); *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 910 (Fed. Cir. 2004). Thus, none of the claims, except claim 3, is limited to a device for stereophotogrammetry that is portable.

In the Decision to Institute, we declined to construe this term as a means plus function term under 35 U.S.C § 112(f). Dec. to Inst. 9–12. Although Petitioner disagrees and asserts that the term “device for stereophotogrammetry” should be construed under 35 U.S.C. § 112(f), Petitioner presents no arguments other than those in the Petition that we addressed in the Decision to Institute. Reply 7–8. Petitioner further acknowledges that “an express construction may not be necessary for the Board to evaluate patentability.” *Id.* at 8. For the reasons discussed in the Decision to Institute, we do not construe *device for stereophotogrammetry configured for an acquisition of two views according to two different angles* as a means plus function term under 35 U.S.C. § 112(f).

Our Decision to Institute applied the plain and ordinary meaning to this term without any express construction to the remaining language of this limitation, including “configured for an acquisition of two views according to two different angles.” Dec. to Inst. 9–11. In the context of the challenged claims, the parties dispute the implications of the plain and ordinary meaning.

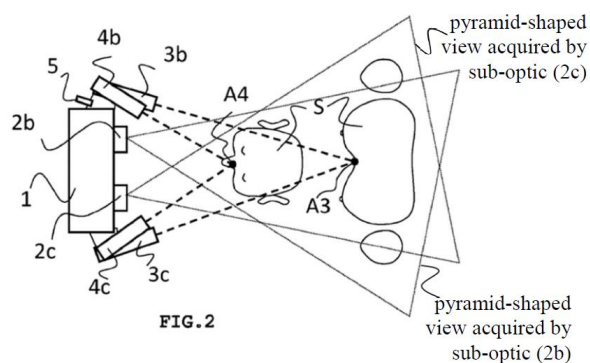
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Patent Owner asserts that “configured for an acquisition of two views” requires acquiring the two views from spaced viewpoints, i.e., that the sub-optics be spaced. PO Resp. 1–6. Patent Owner also argues that we must further construe the term to mean the device must be configured to acquire the two views at two different angles, where “two different angles” means that the views are acquired by sub-optics having a different angle of “optical axis.” *Id.* at 5–25. Noting Patent Owner’s citation of Figure 2 of the ’334 patent as a possible implementation of the device, Petitioner contends that Patent Owner incorrectly asserts the claims require each axis of each of the sub-optics be angled inwards. Reply 1 (citing PO Resp. 6–7; Ex. 1053, Supplemental Declaration of Gerhardt Paul Otto, Ph.D. (“Supp. Otto Decl.”) ¶¶ 9–10). According to Petitioner, the plain language of the limitation “two views according to two different angles” does not recite that the sub-optics are angled, but only that the sub-optics view the subject from different angles. *Id.*

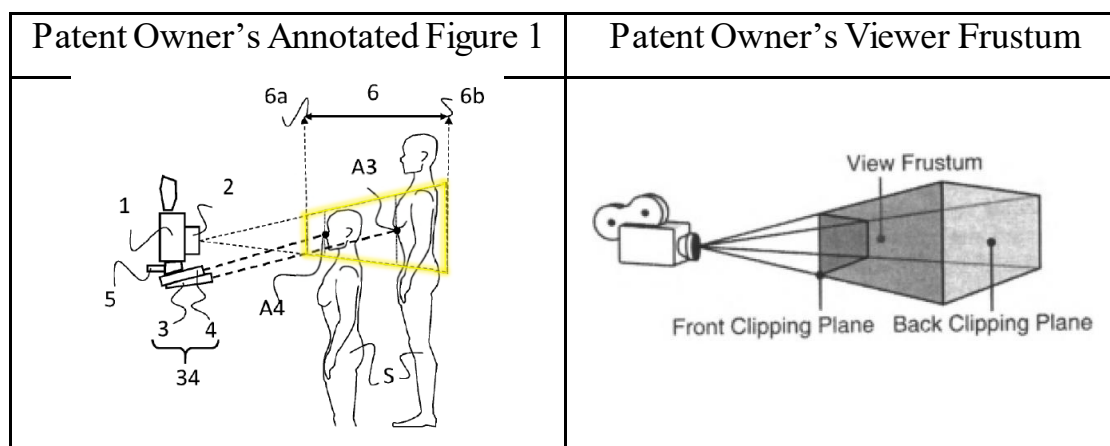
Noting that a viewpoint is the position from which a scene is observed or photographed, Patent Owner argues that the claimed “two views” requires two photographs with the optics so spaced as to acquire two views from different viewpoints. PO Resp. 1 (citing Ex. 2018, Declaration of Dr. Daniel van der Weide (“van der Weide Decl.”) ¶¶ 33–35, 57, 58; Ex. 2019, 188). According to Patent Owner, each view is a pyramid shaped view frustum. *Id.* at 2–4 (citing Ex. 1022, 10:3–14 for the proposition that each view is a “pyramid of the view taking corresponding to sub-optics (2b) or (2c)”); Ex. 2018, van der Weide Decl. ¶¶ 51, 52, 59). Reproduced below is one of Patent Owner’s annotated versions of Figure 2 of the ’334 patent.

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*Id.* at 3.

Below on the left is Patent Owner's annotated version of Figure 1 of the '334 patent; on the right is Patent Owner's illustration of a view/viewing frustum.



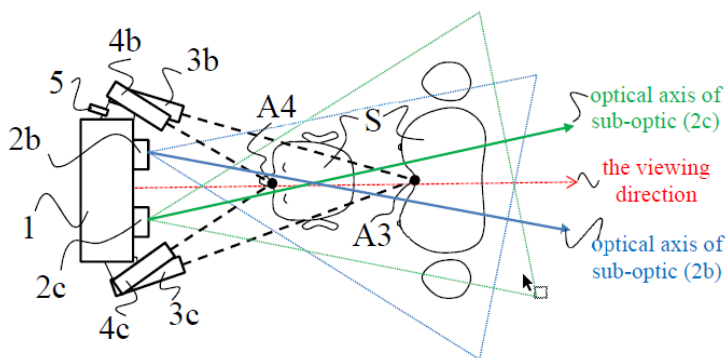
Id. at 3, 4. Patent Owner characterizes the viewing frustum on the right as a flat top pyramid that encompasses the volume of space recorded by a camera having a “front clipping plane” defined by the closest object visible to the camera and a “back clipping plane” defined by the farthest object visible to the camera. *Id.* at 4. Patent Owner identifies the highlighted portion of Figure 1 as the “pyramid of view taking” that defines a frustum shaped volume within which each sub-optic acquires its view. *Id.* at 3. Patent Owner does not identify any discussion in the '334 patent of a pyramid of view taking that “defines a frustum shaped volume.” According to Patent

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Owner, an ordinarily skilled artisan would understand that Figure 1 is a side view of the intersecting flat-top pyramids that encompass the volume of space recorded by double optics 2, where 6A is the front clipping plane (the plane closest to the stereophotogrammetry device and for which the images start to be focused) and 6B is the back clipping plane (the plane farthest from the stereophotogrammetry device and for which the images are no more in focus). *Id.* at 4–5 (citing Ex. 1022, 8:55–59; Ex. 2018, van der Weide Decl. ¶¶ 62–63); Dr. van der Weide also states that three dimensional reconstruction of a subject can be obtained only where the two pyramid-shaped view frustums intersect (stating that in Figure 1 the field of view of closer point position A4 is defined by the intersection of the pyramid of the view taking corresponding to sub-optics (2b) or (2c) with the plane perpendicular to the viewing direction and including point A4, and the field of view of at the farther point position A3 is defined by the intersection of the pyramid of the view taking corresponding to sub-optics (2b) or (2c) with the plane perpendicular to the viewing direction and including point A3). *See* Ex. 2018, van der Weide Decl. ¶ 78–79.

Reproduced below is another annotated version of Figure 2 of the '334 patent provided by Patent Owner.



PO Resp. 18. Figure 2 represents a “possible implementation” of the '334 patent’s device viewed from the top. Ex. 1022, 4:1–2. Patent Owner

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annotates Figure 2 by coloring the light pyramid extending from sub-optic 2b in blue and coloring the light pyramid extending from sub-optic 2c in green. PO Resp. 17–18 (citing Ex. 2018, van der Weide Decl. ¶ 93). Patent Owner also adds a solid blue line and solid green line at the center of each sub-optic to illustrate the “optical axis” of the sub-optic. *Id.* Patent Owner does not identify any corresponding discussion in the Specification.

Petitioner contends that the claim language does not require that the sub-optics be angled, but instead only requires that the sub-optics “view” the subject from different angles. Reply 1–7. Patent Owner contends that the claim language does not mention light from the subject object be imaged, or the angles at which light is received from different points on the object. PO Resp. 19. According to Patent Owner, “[r]ather the ‘two different angles’ limitation defines an intrinsic feature of the device, i.e. how it is configured.” *Id.* (citing Ex. 2018, van der Weide Decl. ¶ 100).

Having considered the claim language, the specification, the prosecution history, and the extrinsic evidence, for the reasons discussed below, we conclude that the claim language does not mean that the sub-optics are angled, but instead means that they each view a subject from different angles.

2. *Analysis*

a) *The claim language*

The relevant language of claim 1 recites “[a] device for stereophotogrammetry configured for an *acquisition of two views according to two different angles.*” Ex. 1022, claim 1 (emphasis added). The recitation “according to two different angles” immediately following the recitation “acquisition of two views” suggests that the recited “two different angles” concerns the views themselves. Recognizing that claim 1 recites the device

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is “configured to” acquire these views, however, we further analyze the claim language. *See* PO Resp. 1, 19 (“the ‘two different angles’ limitation defines an intrinsic characteristic of the device, i.e., how it is ‘configured.’”).

We understand the parties to argue that, based on plain language, the claimed two sub-optics must be configured (i.e., physically orientated) in a manner that makes them capable of acquiring “two views according to two different angles.” As discussed further herein, Petitioner’s arguments emphasize whether the view of the subject is from two different angles; Patent Owner’s arguments emphasize whether the optical axes of the sub-optics are at two different angles. Petitioner points out that “PO asserts the challenged claims require the axis of each set of sub-optics to be angled inwards.” Reply 1. Patent Owner argues “[a] POSITA would understand that each (i) ‘optical path’ in Fig. 6 extends along the optical axis of the sub-optic, and (ii) optical axis is located at the center of the view frustum acquired by the sub-optic and is the axis of the view.” PO Resp. 16–17 (citing Ex. 2018, van der Weide Decl. ¶¶ 89, 94–96).

Patent Owner contends “the ‘subject’ is claimed only in connection with the ‘positioning system (34)’ ‘configured to signal when a target subject (S) is reaching[] . . . pre-defined distance positions (A3, A4) of the target subject (S) relative to the camera body (1).” *Id.* at 19. This claim language limits the device to one that “is further comprising” a positioning system “configured to signal when a target subject (S) is reaching one of two pre-defined distance positions (A3, A4) relative to the photogrammetry device.” Ex. 1022, 11:60–63.

Patent Owner’s argument that this language further limits the axes of the sub-optics is unavailing. As discussed above, Patent Owner contends that “configured for an acquisition of two views” requires acquiring the

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views from spaced viewpoints. PO Resp. 1. Patent Owner’s discussion of the frustum or the pyramid of the view taking in Figure 2 of the ’334 patent does not address the broad claim language reciting that the acquisition generates a pair of images, one for each of the two views. Ex. 1022, 11:54–59 (claim 1), *see* Section V.A.1 herein. The claim language merely requires two views—it does not require that the two views be taken by sub-optics with optical axes that are not parallel or point inward. The claimed “views” refer to viewed subject material (e.g., a desired target subject or merely whatever exists at the viewing plane).

For similar reasons, we also find unavailing Patent Owner’s argument that the claims “disclose configuring the sub-optics according to ‘two different angles’ as a prerequisite to ‘pre-defining’ the ‘positions (A3, A4) of the target subject (S),’ as further claimed, and locating the subject at such positions within the two views.” PO Resp. 19–20 (citing Ex. 2018, van der Weide Decl. ¶ 103); *see also id.* at 20 (arguing that dependent claims drawn to locating a target subject at the predefined distance before taking stereo-pairs at the same predefined distance position also supports this argument). We likewise find unavailing Patent Owner’s argument that “the ‘two different angles’ limitation has nothing to do with the angles at which the sub-optics receive light from a subject, but rather defines the space within which the subject must be located to be imaged in the first place.” *Id.* at 20 (citing Ex. 2018, van der Weide Decl. ¶ 100); Sur-reply 2. These arguments are inapposite, and do not preclude the claimed sub-optics from being parallel, as Patent Owner argues. Rather, Patent Owner acknowledges, conventional stereophotogrammetry devices can include parallel sub-optics “configured (spaced) to acquire two views,” and provide a stereoscopic binocular area where “the parallel views intersect to form

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stereo-pairs that can be reconstructed into three-dimensional representations.” PO Resp. 5–6; Ex. 2018, van der Weide Decl. ¶ 67; Ex. 2020,⁵ 90. Hence, the target subject S can be located at distances within that stereoscopic binocular area, which is consistent with Patent Owner’s argument that the limitation “defines the space within which the subject must be located to be imaged in the first place.” Ex. 2020, 90; PO Resp. 6, 20–21.

According to Patent Owner, Petitioner’s argument that images acquired by mirrors spaced apart acquires two views “necessarily taken at different angles” improperly reads the “two different angles” limitation out of claim 1. PO Resp. 7–8 (citing Pet. 32 (Petitioner’s discussion of Plassmann)), 22 (arguing that “[s]uch a construction is inconsistent with the plain language of the claims and written description and would render the limitation meaningless.”); Sur-reply 5–6. Patent Owner further argues that Petitioner “reads ‘the subject’ [of the stereophotogrammetry] into the claim to argue that ‘two different angles’ refers to ‘the different angles from each of the sub-optics to the subject.’” Sur-reply 5. Claim 1 explicitly recites “said acquisition generating a pair of images with one image corresponding to one of the two views and the other image corresponding to the other of the two views.” Ex. 1022, 11:56–58 (claim 1). As discussed above, we agree with Petitioner and conclude that acquiring views “according to two different angles” relates to acquiring images of a subject. We also agree with Petitioner and conclude that claim 1 does not otherwise limit how the two sub-optics are displaced, e.g., to exclude a conventional stereophotogrammetry device, that can acquire views of a subject from

⁵ Richard W. Kroon, *3D A-to-Z, An Encyclopedic Dictionary* (2012).

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different angles. *Id.* at 11:43–58; Reply 7 (citing Ex. 1053, Supp. Otto Decl. ¶ 31 (“[t]he claim does not recite ‘displacing the sub-optics’ other than by means of its reference to acquiring views ‘according to two different angles’”).

We also agree with Petitioner that “the preamble here is not limiting, because the body of the claim provides a complete description of the device.” Reply 6–7 (citing *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997)). The preamble for claim 1 recites “[a] device for stereophotogrammetry,” but “[g]enerally, the preamble does not limit the claims.” Ex. 1022, 11:42; *Georgetown Rail Equip. Co. v. Holland L.P.*, 867 F.3d 1229, 1236 (Fed. Cir. 2017). Regardless, as Petitioner notes, no “canon of claim construction is absolute in its application and [] some surplusage may exist in some claims.” Reply 7 (alteration in original) (quoting *Decisioning.com, Inc. v. Federated Dep’t Stores, Inc.*, 527 F.3d 1300, 1312 n.6 (Fed. Cir. 2008) (acknowledging that proper construction of “remote interface” arguably “render[s] the term ‘public’ in [a dependent claim] surplusage”)).

b) The Specification

Figures 2 through 5 of the ’334 patent illustrate pyramid-shaped views acquired by the sub-optics where the pyramids are inwardly angled (rather than being perpendicular to the device’s plane). Ex. 1022, Figs. 2–5, 10:3–15 (discussing the pyramid of the view taking corresponding to sub-optics (2b) or (2c) with the plane perpendicular to viewing directions including close distance point A4 and farthest distant point A3). The Specification indicates that all of these figures illustrate *possible* or *exemplary* implementations. *See, e.g., id.* at 3:59–4:5 (stating that Figures 1, 2 and 3 each illustrate a “possible implementation”), 9:47–48 (stating that Figure 4 is

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an “exemplary device”), 9:55–56 (stating that Figure 5 is an “exemplary device”). Nevertheless, the claims do not limit the optical axes of the pyramids and the Specification does not discuss the optical axes of the pyramids as essential features of the claimed invention. To the contrary, the Specification provides that “[t]he double optics of the stereophotogrammetry device can be manufactured in different ways without impacting the functionality of the invention, provided that it is characterized by an increased depth of field.” *Id.* at 4:38–41.

Dr. Otto notes that the written description does not discuss optical axes or the frustums referenced by Dr. van der Weide. Ex. 1053, Supp. Otto Decl. ¶ 27. Rather than identify converging inwardly angled optical axes, the Specification repeatedly refers to different angles of the sub-optics relative to the viewed subject in a manner similar to the claims. *See, e.g.*, Ex. 1022, 4:28–30 (referring to “double optics enabling the acquisition of two simultaneous views with different angles of the subject”), 4:44–46 (referring to “double optics” using “secondary mirrors each receiving one image of the subject with a slightly different angle”). The Specification also acknowledges that “angle” could refer to “viewing angle,” thus suggesting that angle may merely refer to a different view. *Id.* at 3:47–49 (referring to “double optics enabling to simultaneously acquire at least two pictures according to two different viewing angles”), 8:44–47 (referring to “double-optics” with “two sub-optics (2*b*) and (2*c*), enabling the acquisition of a stereo pair corresponding to two slightly different viewing angles”).

The written description also refers to a series of stereo-pairs taken such that the “angle of the views are close the these [sic] presented in FIG. 9.” *Id.* at 11:33–34. We reproduce Figure 9 of the ’334 patent below.

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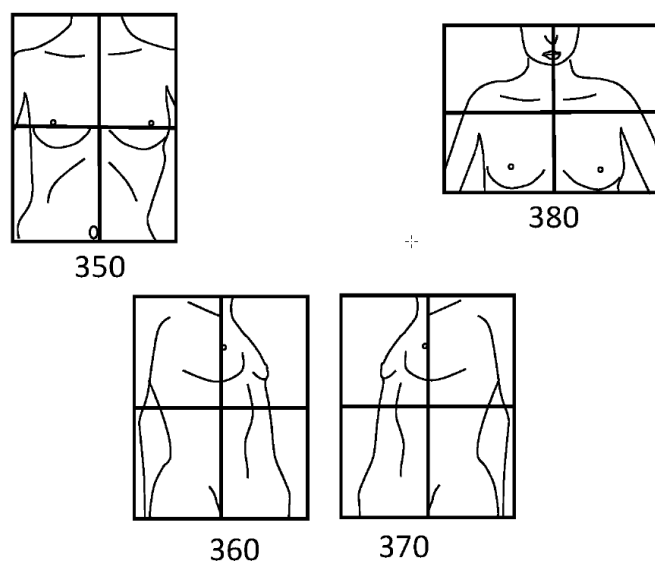
**FIG. 9**

Figure 9 “present[s] viewpoints optimized for imaging a torso using a field of view close to an A3 surface format.” *Id.* at 4:19–20. The “angle of the views,” in this context, refers to the angle the stereo-pairs are taken relative to the position of the subject. *Id.* at 11:30–42. Although the stereophotogrammetry device is moved between acquisition of each stereo-pair, the term “angle” in this context does not reference an optical axis, but rather is relative to the position of the subject. As the ’334 written description does not address an optical axis or define an angle of the sub-optics, it does not serve to limit or particularly define claim scope with regard to the optical axis.

We find unavailing Patent Owner’s arguments concerning problems described in the Background section of the Specification and the advantages of the ’334 patent. PO Resp. 9–15. For example, the ’334 patent discloses that portable stereophotogrammetry devices previously developed included “a single, nominal distance for picture taking which is optimized either for the face or for breast, but not optimized for both applications at the same

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time,” according to Patent Owner. *Id.* at 8–9 (quoting Ex. 1022, 3:16–20; citing Ex. 2018, van der Weide Decl. ¶ 73). Patent Owner argues that the ’334 patent “ties the ‘two different angles’ limitation to overcoming the problem in the prior art and achieving the advantage of the invention” (i.e., a single stereophotogrammetry device for both distances). *Id.* at 9–10 (citing Ex. 1022, 3:56–61); *see also id.* at 10 (citing Ex. 1022, 4:43–46, 8:44–47; Ex. 2018, van der Weide Decl. ¶ 76) (making same argument).

According to Patent Owner, however, if the sub-optics are configured for parallel views, the field of view at point (A4) in Figure 2 “is too small to image the face and would not achieve the ‘advantage of the invention,’ *i.e.*, ‘a single portable stereophotogrammetry system . . . enabling the 3D reconstruction of the head . . . and . . . torso.’” *Id.* at 15 (quoting Ex. 1022, 8:28–35; citing Ex. 2018, van der Weide Decl. ¶¶ 56, 87) (alterations in original). This argument is unavailing. We agree with Petitioner that “[s]imply moving the subject further from the camera would place the face” within the view pyramids. *See* Reply 3–4; Ex. 1053, Supp. Otto Decl. ¶ 24. As can be seen for the version of Figure 2 modified by Patent Owner to show parallel view pyramids, a sufficient field of view for the face and torso is within the binocular area if the subject is moved further from the camera. *See* PO Resp. 14 (modifying Ex. 1022, Fig. 2); *see also* Ex. 1053, Supp. Otto Decl. ¶ 29 (testifying that moving further away “[i]f no other changes were made, . . . would slightly lower the 3D resolution of the surface captured by the device compared to using angled frustums,” “[h]owever, in this application area a slight decrease in resolution is acceptable”).

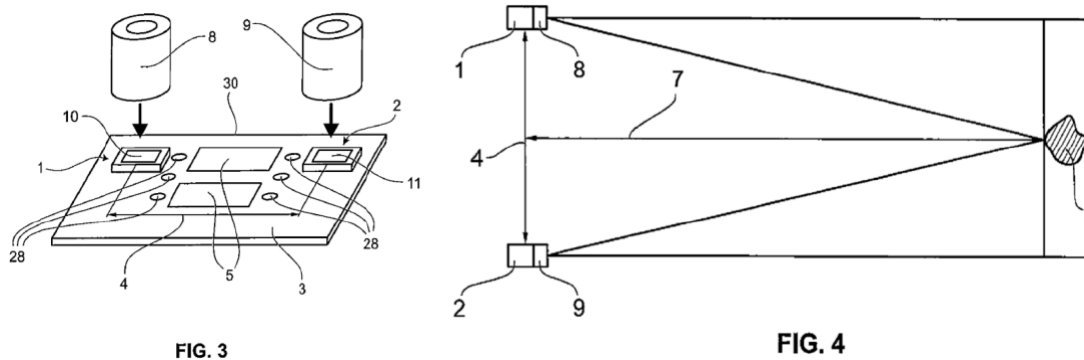
In sum, we find that the ’334 Specification does not address optical axes, and does not serve to limit the plain and ordinary meaning of this limitation so as to exclude parallel sub-optics.

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c) The prosecution history

We next turn to the patent prosecution history. The '334 patent is a continuation of U.S. Patent No. 10,070,119 B2 (“the ’119 patent”). *See* Ex. 1022, code (63). Prosecution history “can often inform the meaning of the claim language by demonstrating how the inventor understood the invention.” *Phillips*, 415 F.3d at 1317. The prosecution history of the ’119 patent is relevant to the claim construction issues before us. *See* Ex. 1002.

In particular, Patent Owner treated the “according to two different angles” language differently during prosecution of the ’119 patent than it does now. During prosecution, the Examiner rejected the challenged claims over Hoffmeier⁶ and concluded that Hoffmeier disclosed a stereophotogrammetry device comprising “two sub-optics (2b) and (2c) configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1002, 63–66; Ex. 1053, Supp. Otto Decl. ¶ 12. Figures 3 and 4 of Hoffmeier are reproduced below side by side (Figure 3 is on the left and Figure 4 is on the right).



Ex. 1005, Figs. 3, 4. Hoffmeier Figure 3 depicts the Hoffmeier device.

Ex. 1053, Supp. Otto Decl. ¶ 13. Hoffmeier Figure 3 is a perspective view

⁶ US 2011/0175987 A1, *Stereo Camera System*, published July 21, 2011 (Ex. 1005)

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of the Hoffmeier system. Ex. 1005 ¶ 25. Hoffmeier Figure 4 “shows the schematic structure of a stereo camera system according to Figs. 1 to 3” with image detection sensors 1, 2 arranged at a defined distance from each other and optical systems 8, 9 at a distance 7 from object 6 in front of the stereo camera system. *Id.* ¶ 37. Thus, Hoffmeier Figure 4 shows components 8, 9 each consisting of one or more lenses and/or further optical elements. Ex. 1053, Supp. Otto Decl. ¶ 14.

Hoffmeier describes lenses that face forward rather than at an angle. Ex. 1005, Figs. 3, 4, ¶ 35 (“The two optical systems 8, 9 can be coupled to the board 3 such that the respective optical axis of an optical system 8, 9 runs through the center point of the image sensing area 10, 11 of an image detection sensor 1, 2”); *see also* Ex. 1053, Supp. Otto Decl. ¶ 14 (Petitioner’s witness, Dr. Otto, opining that Hoffmeier Figure 4 “shows components 8 and 9 as having parallel axes”).

During prosecution Patent Owner submitted a statement of CEO and ’334 named patent inventor, Dr. Jean-Philippe Thirion, responding to the Examiner’s rejection over Hoffmeier. *See* Ex. 1002, 88. In that submission, Patent Owner acknowledged that Hoffmeier teaches claim 1’s “two different angles” recitation as follows:

Being devoid of any positioning system external to the stereovision system itself makes Hoffmeier quite different from the invention described in ’981 [(referencing the ’981 application that led to the ’119 patent)]. Hoffmeier therefore discloses “A device for stereophotogrammetry comprising a camera body (1) and a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views **according to two different angles**” as in claim 1 of ’981, but it is all that Hoffmeier discloses relative to claim 1 of ’981.

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Ex. 1002, 92 (*italic emphasis omitted, bold emphasis added*). Patent Owner further admitted that “8 and 9 in FIG 3 of Hoffmeier exactly correspond to 2b and 2c i[n] FIG. 2 of [the ’334 patent].” *Id.* at 91–92.

Patent Owner’s admissions during prosecution indicates to the public that Patent Owner understood that spaced optics with parallel optical axes may, nonetheless, fall within the scope of claim 1 of the ’334 patent. Patent Owner now downplays these admissions by arguing that Hoffmeier “is ambiguous as to whether the optical axes of 8, 9 are angled inwards, or are parallel.” Sur-reply 7. Patent Owner’s ambiguity arguments are unavailing. Patent Owner cannot now assert that “the plain and ordinary meaning discerned from the claims and specification” (*id.*) is different from the meaning Patent Owner acknowledged during prosecution of the ’119 patent. Even if the term were ambiguous, Patent Owner admitted in the prosecution record that, for purposes of claim construction, Hoffmeier taught the claimed limitation “two views according to two different angles.” Ex. 1002, 92. The prosecution history, thus, suggests that Hoffmeier’s optical axes orientation is not important to whether the “two different angles” recitation is met. As such, Patent Owner’s prosecution history statement aligns with the present arguments of Petitioner, not Patent Owner.

d) Extrinsic evidence

Although less critical than the prosecution history, extrinsic evidence⁷ also supports Petitioner’s claim construction position. During district court litigation involving the ’119 patent, Patent Owner responded to Petitioner’s

⁷ Patent Owner also argues that a technical dictionary supports that views are pyramid-shaped frustums with an optical axis. PO Resp. 4–6, 16–17. We address Patent Owner’s discussion of this subject matter in the Introduction above. *See* Section V.B.1 herein.

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invalidity allegations regarding the Plassmann reference by agreeing that Plassmann teaches the now disputed “according to two different angles” language, stating QuantifiCare agrees that the quoted language and figure include, *inter alia*, a double-optics comprising two sub-optics configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1037, 2; *see also* Reply 5–6. Patent Owner now disputes that Plassmann teaches this recitation. *See, e.g.*, PO Resp. 27 (arguing that “[Petitioner’s] contention that Plassmann acquires ‘two views according to two different angles’ is incorrect”) (emphasis omitted). Thus, Patent Owner’s position in the District Court litigation was consistent with its position during prosecution, but inconsistent with its position in the current proceeding.⁸ This inconsistency at least somewhat weighs against Patent Owner’s claim construction arguments.

e) Claim construction conclusion

Having considered the evidence of record, including the language of the claims, the specification, the prosecution history, and the extrinsic evidence, as well as the argument put forth by the parties, we find that the preponderance of the evidence supports a construction that claim 1’s “two views according to two different angles” language does not require that the optical axis of each sub-optic be angled, but instead requires only that the sub-optics view the subject from different angles.

⁸ Patent Owner argues that this extrinsic evidence should be disregarded. Sur-reply 8–9. We disagree. While the extrinsic evidence is entitled to less weight, it nonetheless bolsters the intrinsic evidence establishing that Patent Owner—outside of the instant proceeding—understood “two views according to two different angles” in accordance with Petitioner’s claim construction.

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VI. ANALYSIS OF PRIOR ART CHALLENGES

A. *Introduction*

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Additionally, the obviousness inquiry typically requires an analysis of “whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”)); *see In re Warsaw Orthopedic, Inc.*, 832 F.3d 1327, 1333 (Fed. Cir. 2016) (citing *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d 1356, 1360 (Fed. Cir. 2006)).

An obviousness analysis “need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court

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can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR*, 550 U.S. at 418; *accord In re Translogic Tech., Inc.*, 504 F.3d 1249, 1259 (Fed. Cir. 2007). Petitioner cannot satisfy its burden of proving obviousness by employing “mere conclusory statements.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016). Instead, Petitioner must articulate a reason why a person of ordinary skill in the art would have combined the prior art references. *In re NuVasive*, 842 F.3d 1376, 1382 (Fed. Cir. 2016).

A reason to combine or modify the prior art may be found explicitly or implicitly in market forces; design incentives; the “interrelated teachings of multiple patents”; “any need or problem known in the field of endeavor at the time of invention and addressed by the patent”; and the background knowledge, creativity, and common sense of the person of ordinary skill. *Perfect Web Techs., Inc. v. InfoUSA, Inc.*, 587 F.3d 1324, 1328–29 (Fed. Cir. 2009) (quoting *KSR*, 550 U.S. at 418–21).

As part of determining whether a claim is obvious in light of the prior art, we consider any relevant evidence of secondary considerations of non-obviousness. *See Graham*, 383 U.S. at 17. Notwithstanding what the teachings of the prior art would have suggested to one of ordinary skill in the art at the time of the invention, the totality of the evidence submitted, including objective evidence of non-obviousness, may lead to a conclusion that the challenged claims would not have been obvious to one of ordinary skill. *In re Piasecki*, 745 F.2d 1468, 1471–72 (Fed. Cir. 1984). Petitioner argues there are no secondary considerations applicable in this proceeding.

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Pet. 74–76.⁹ Patent Owner contends that secondary considerations demonstrate the claims recite patentable subject matter. PO Resp. 57–67; Sur-reply 25–30.

We analyze the asserted grounds of unpatentability in accordance with these principles to determine whether Petitioner has met its burden to establish by a preponderance of the evidence that the claims are unpatentable.

B. Plassmann

Plassmann is a World Intellectual Property Organization publication that relates to an apparatus for the production of stereoscopic images. Ex. 1007, codes (10), (19), (57). Plassmann describes variations of the “MAVIS” system. *Id.* at 11:25–12:29. Plassmann’s apparatus captures “two images [which are] needed to form a stereo image . . . to produce a three-dimensional representation of the subject.” *Id.* at 12:25–29. The apparatus further includes two light emitting diodes (LEDs) emitting respective beams which converge at a particular distance in front of the apparatus. *Id.* at 12:7–13.

Below, we reproduce Plassmann Figures 1A and 1B.

⁹ The last correctly numbered page of the Petition is page 73. The Petition incorrectly numbers subsequent pages, with page 74 unnumbered and pages 75–76 numbered pages 2 and 3.

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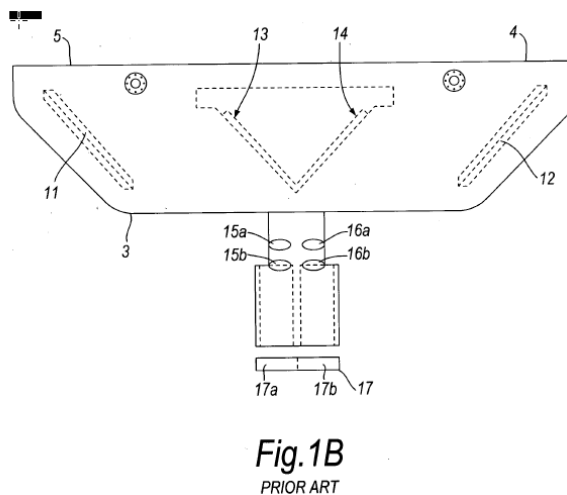
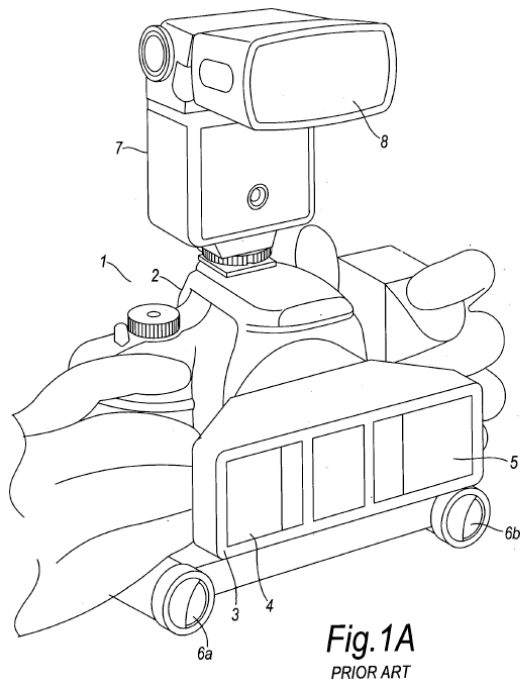


Figure 1A is a perspective representation of an apparatus for obtaining stereoscopic images, showing body 2, e.g., a camera, and adaptor 3. *Id.* at 11:3–4, 11:28–12:4. Further Figure 1B shows a “plan view” of adaptor 3 in further detail. *Id.* at 11:5–6, 12:13–14. Adaptor 3 has two apertures 4, 5 which respectively collect light that is respectively focused onto charge coupled device parts 17a, 17b, forming respective first and second images. *Id.* at 12:15–25. The first and second images form a stereo image used to produce a three-dimensional representation of a subject. *Id.* at 12:25–29. As shown in Figure 1A, Plassmann’s apparatus includes two low-powered light emitting diodes (LEDs) 6a, 6b, each provided with a [focusing] lens to produce a beam of light and being arranged so that the beams converge and meet at a point a fixed and desired distance from the apparatus, this distance corresponding to the distance at which the camera lens is [focused]. *Id.* at 12:8–13. The converging beams act as “a guide to show distance between the apparatus and subject.” *Id.* at 16:12–14.

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C. Trueillet

Treuillet is a paper that relates to an “approach to build 3-D models of skin wounds from color images.” Ex. 1016, 752. Treuillet explains that “[b]y taking two color images from different points of view, stereophotogrammetry allows the computation of the 3-D coordinates of numerous points on the skin lesion.” *Id.* at 754.

By way of imaging technology background, Treuillet describes the MAVIS II system as “a reflex digital camera equipped with special dual lens optics for recording two images from slightly different viewpoints, generating a stereo pair” which includes “two tube-shaped projectors produce beams of light which intersect in a single spot when the camera is held at the right distance” at “about 80 cm from the wound,” with a tolerance of plus or minus 15 cm. *Id.* at 755.

D. Staller

Staller is a U.S. patent that relates to a diffuser attachment for a camera including a “distance measurement device [that] uses a pair of light beams which intersect at a repeatable distance from the diffuser body to readily enable positioning of an object to be photographed at that repeatable distance.” Ex. 1006, codes (10), (12), (57).

Below, we reproduce Figure 2, which shows a front perspective view of a diffuser. *Id.* at 3:13–14.

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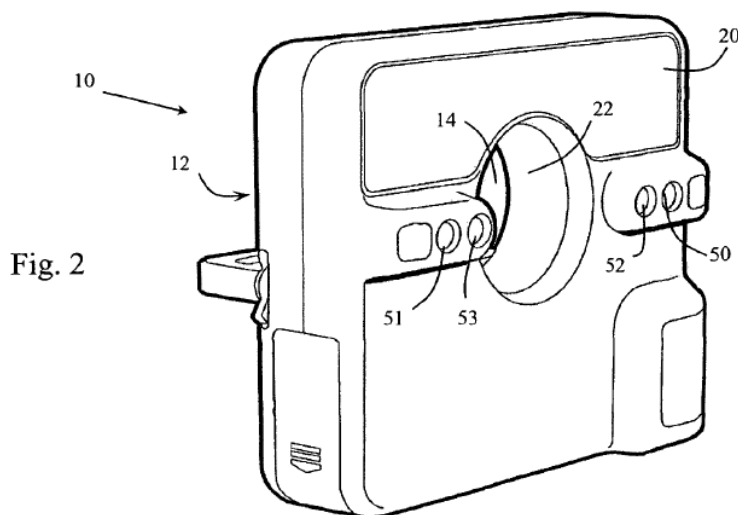


Fig. 2

As shown in Figure 2, the diffuser “includes a distance measurement device or indicator in the form of a plurality of light beam emitters 50–53.” *Id.* at 5:13–15. “Each pair of emitters 50–51, 52–53 creates a pair of angled light beams which intersect at different distances in front of diffuser body 12.” *Id.* at 5:17–19. As such, “[e]ach of the pairs of light beams allows diffuser 10 to be relocated at the same repeatable distance from a subject.” *Id.* at 5:19–21; *see id.* Fig. 4. That is, each pair of emitters indicates a different distance. *Id.* at 2:30–35; *see id.* at 5:64–6:2.

Further, either of the emitter pairs, i.e., pair 50–51 or pair 52–53, are selected using a selector switch. *Id.* at 5:38–41. By selecting a particular emitter pair, the distance measurement device indicates a particular distance measurement. *See id.*

E. Peng

Peng is a paper that relates to an “automatic 3D reconstruction method” to reconstruct a 3D scene using “complementary stereo information from four cameras.” Ex. 1009, 1. In particular, Peng’s “3D model reconstruction system us[es] images acquired from multiple stereo pairs.” *Id.* at 2. Peng explains that a “normal camera” has a “limited field-of-view.”

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Id. at 6. Accordingly, Peng describes a process to “reconstruct a large and integrated scene” by “finding more than three spatial matched points between different 3D models [and] can achieve 3D model stitching.” *Id.*; *see id.* at 2–3.

F. Claims 1–5, 9–12, 15–16, and 20–23 As Obvious over Plassmann, Treuillet, and Staller

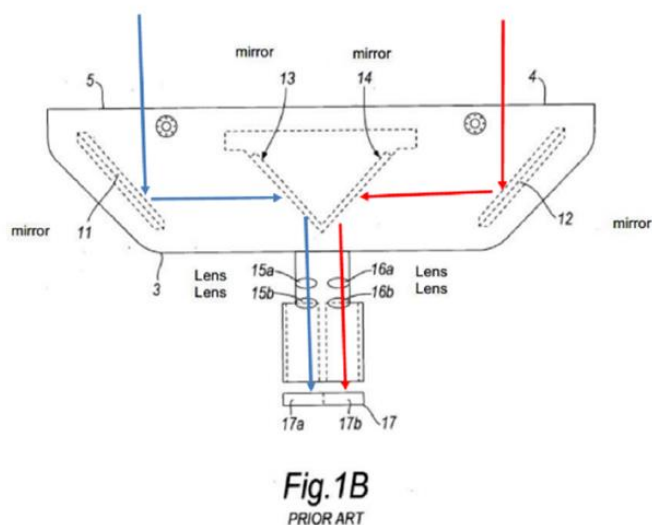
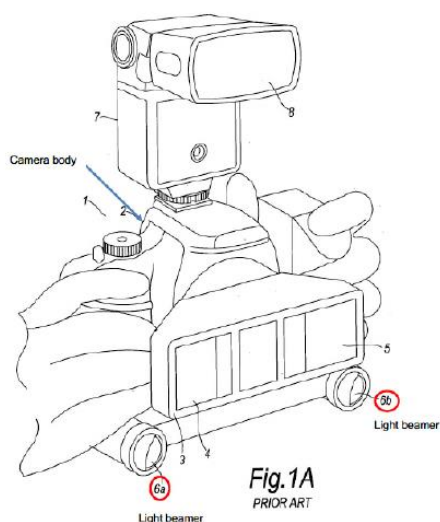
1. *Claim 1*

a) *Claim Limitation 1.01*

Claim limitation 1.01 recites

[a] device for stereophotogrammetry configured for an acquisition of two views according to two different angles, said acquisition generating a pair of images, with one image corresponding to one of the two views and the other image corresponding to the other of the two views, this pair of images being referred to as a stereo-pair.

Figures 1A and 1B of Plassmann, as annotated by Petitioner are reproduced below.



Pet. 32 (citing Ex. 1007, Figs. 1A, 1B). Plassmann identifies Figure 1A as showing a known apparatus for obtaining stereoscopic images and Figure 1B

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as showing a known adaptor used in the apparatus of Figure 1A. Ex. 1007, 12:3–6. Petitioner cites Plassmann as disclosing a device for stereophotogrammetry including adapter 3 attached to camera body 2 to capture stereo images along paths labelled in red and blue. Pet. 31. Petitioner states that Plassmann’s adaptor 3 “acquires two views of an object from two different angles via mirrors 11 and 12, to reconstruct a 3-D representation of imaged objects.” *Id.* at 32 (citing Ex. 1007, 12:25–29, stating, “[t]he first and second images are the two images needed to form a stereoimage and data from the two images may be analyzed using suitable software to produce a three-dimensional representation of the subject.”).

Patent Owner contends that Petitioner fails to establish that Plassmann’s sub-optics are configured to acquire their views according to two different angles, as claimed. PO Resp. 26–31. Citing Petitioner’s annotated versions of Plassmann, Patent Owner contends that Petitioner acknowledges Plassmann teaches views that are along parallel optical axes and not on optical axes that are at two different angles. *Id.* (citing Pet. 22–23, 31–32); *see id.* at 30 (stating “[t]he Petition does not contend that Plassmann’s optical axes or view frustums are not parallel.”). Noting Petitioner’s assertion that in Plassmann mirrors 11 and 12 acquire two different views of an object from two different angles, Patent Owner repeats its contention that the spacing of the mirrors means only that each mirror acquires a different view, not that the views are acquired at different angles, a contention that we found unpersuasive in our claim construction analysis. *Id.* at 30–31; *see* Section V herein.

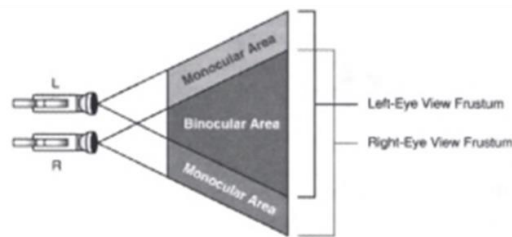
According to Patent Owner “[t]his parallelism of the optical axes means the angles of the views of the sub-optics are the same, not different.” *Id.* at 30. As we discuss extensively in Section V herein, we decline to adopt

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a claim construction of the two views that requires the optical axes of the sub-optics be at different angles, as Patent Owner advocates. Instead we construe claim 1's "two views according to two different angles" language to not require that the optical axis of each sub-optic be angled, but instead to only require that the sub-optics view the subject from different angles.

Reproduced below is Patent Owner's illustration of a conventional stereophotogrammetry device configured to acquire two views that Patent Owner characterizes as being at the same angle.



Id. at 5 (citing Ex. 2020, 90; Ex. 2018, van der Weide Decl. ¶ 67).

According to Patent Owner, the L and R camera are configured, i.e., spaced, to acquire two views, but because the "Left Eye View Frustum" and the "Right Eye View Frustum" are parallel, the two views are parallel and acquired at the same angle. *Id.* Patent Owner's acknowledgment of this arrangement as conventional is important, as the claim as construed above encompasses this arrangement.

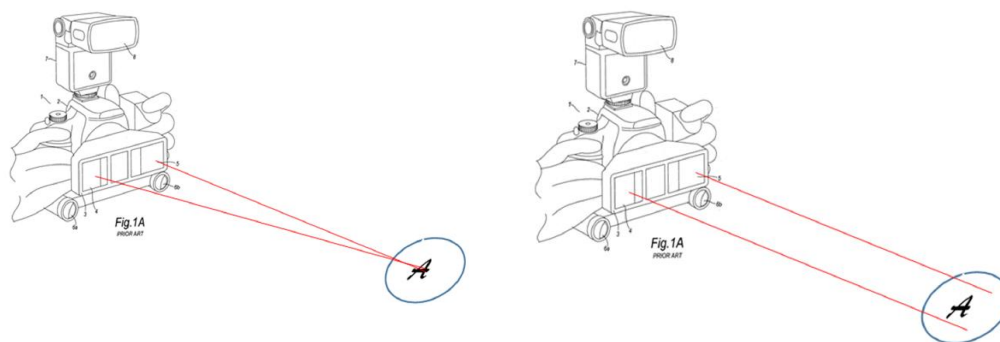
Petitioner further argues that even if we construed the "two views according to two different angles" limitation to exclude parallel sub-optics, as Patent Owner suggests, Plassmann discloses the limitation because Plassmann's example image (a stylized letter A recessed into the surface of a pot of hand cream) can appear in the same position in left and right hand images only if both sub-optics were angled inward. Reply 10–11; Ex. 1007, 12–13. Patent Owner contends we should ignore this argument because

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Petitioner manipulated the width-to-height ratio when creating the illustration discussed at page 11 of the Reply. Sur-reply 11–12. Even if the scale in Petitioner’s illustration is incorrect, the point of Petitioner’s illustration does not concern the size and height of the image, but instead, demonstrates that the image of the stylized A appears in the center of the circle representing the pot of cream (as in Plassmann, Fig. 3A) when Plassmann’s sub-optics is angled inward and appears shifted in each of the left hand and right hand images if the sub-optics is parallel. *See* Ex. 1053 Supp. Otto Decl. ¶¶ 42–48. Dr. Otto notes that Petitioner’s position is consistent with the position asserted by Dr. van der Weide, i.e., that parallel sub-optics would produce images in which the object is markedly shifted in each image. *Id.* ¶ 36 (citing Ex. 2018, van der Weide Decl. ¶ 68). Patent Owner contends that Petitioner’s argument that Plassmann’s sub-optics is angled inwards fails because Fig 3A of Plassmann illustrates the images actually are shifted. Sur-reply 12–16.

Petitioner further supports its analysis with the following annotated versions of Figure 1A of Plassmann, shown side by side.



PO Resp. 10–11. Petitioner states that its annotated figure on the left is indicative of Plassmann’s sub-optics angled inward and the annotated figure

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on the left is indicative of a parallel sub-optics. *Id.*; *see also* Ex. 2044, 4¹⁰ (showing target beams of MAVIS II merging when camera located 80 cm from target).

For purposes of claim 1, we need not determine whether Plassmann discloses inwardly angled sub-optics, as we construed “two views according to two different angles” language to not require that the optical axis of each sub-optic be angled, but instead to require only that the sub-optics view the subject from different angles. Accordingly, we find that Petitioner has demonstrated that Plassmann would have disclosed claim limitation 1.01 to a person of ordinary skill in the art.

b) Claim Limitation 1.02

Claim limitation 1.02 recites

wherein the device is further comprising a positioning system (34) configured to signal when a target subject (S) is reaching one of at least two distinct pre-defined distance positions (A3, A4) relative to the stereophotogrammetry device, the at least two distinct predefined distance positions comprising a closer distance position (A4) and a farther distance position (A3), the closer distance position (A4) corresponding to the target subject (S) being closer to the stereophotogrammetry device and the farther distance position (A3) corresponding to the target subject (S) being farther to the stereophotogrammetry device.”

Petitioner asserts that the combined teachings of Plassmann, Treuillet, and Staller disclose claim limitation 1.02. *See* Pet. 33–39. Petitioner cites Plassmann as disclosing a camera equipped with a positioning system having LEDs that produce low powered light beams 6a, 6b. *Id.* at 33. The LEDs have focusing lenses arranged to cause the light beams 6a, 6b to

¹⁰ Page number refers to page number printed at the bottom of the page of the “Good Practice Guide to the Use of Mavis 2” July 2006.

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converge at a point that is a fixed and desired distance from the apparatus, such that the distance corresponds to the distance where the camera lens is focused. *Id.* at 33–34 (citing Ex. 1007, 12:7–13; Ex. 1003, Declaration of Gerhardt Paul Otto, Ph.D. (“Otto Decl.”) ¶¶ 371–372).

Petitioner contends that a person of ordinary skill would have understood that the device described in Plassmann (i.e., the later generation MAVIS II referred to by Treuillet), like any stereophotogrammetry device, has a depth of field containing many distances at which the camera is focused. *Id.* at 34; *see also id.* at 34 n.5 (citing Ex. 1016, 755; Ex. 1003, Otto Decl. ¶ 374). Petitioner relies on Treuillet to confirm that Plassmann’s device was capable of an expanded depth of field sufficient to image a subject at multiple positions within a 30 cm range, including at least three predefined distance of 65, 80 and 95 cm. *Id.* at 34–37 (citing Ex. 1003, Otto Decl. ¶¶ 116, 377; Ex. 1016, 755). Petitioner argues that both Plassmann and Treuillet describe the use of stereophotogrammetry for wound assessment and monitoring and that Treuillet counsels positioning the device at different distances depending on a wound’s size, locations and healing progress over time. *Id.* at 35–36.

Petitioner cites Staller as disclosing a positioning system employing multiple pairs of light beams to define more than one predefined position. *Id.* at 38. According to Petitioner, a person of ordinary skill would have understood Staller’s disclosure of light beams 56, 57 converging at point 58 on the subject a distance 59, to provide further positioning for taking a picture of a face. *Id.* at 38–39 (citing Ex. 1006, 6:9–15, Fig. 4; Ex. 1003, Otto Decl. ¶ 387). Petitioner argues a person of ordinary skill “would understand Staller’s different light beam pairs, because all intersect along a

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centerline, converge at locations closer to, and farther away from, the device.” *Id.* at 39 (citing Ex. 1003, Otto Decl. ¶ 388).

Petitioner contends that a person of ordinary skill would have had reason to combine the teachings of Plassmann, Treuillet, and Staller. *See id.* at 39–42. Noting that Plassmann and Treuillet are closely related, Petitioner observes that “[t]he device Treuillet describes is identical to that depicted in Plassmann.” *Id.* at 40 n.6 (quoting Ex. 1016, 755, describing MAVIS II as “a reflex digital camera equipped with special dual lens optic for recording two images from slightly different viewpoints, generating a stereo pair” in which “two tube-shaped projectors produce beams of light which intersect in a single spot when the camera is held at the right distance (about 80 cm from the wound”). Petitioner states that, as both Treuillet and Plassmann concern two versions of the same stereophotogrammetry device, a person of ordinary skill would have been motivated to predefine two distances, one closer and one farther away, for different levels of magnification. *Id.* at 39–40. Petitioner further states that “[t]he need to reproducibly image features from these repeatable distances would have further motivated POSITA to apply the teachings of Staller, regarding use of two pairs of light beamers, with the device disclosed in Plassmann/Treuillet, to identify those positions.” *Id.* (citing Ex. 1003, Otto Decl. ¶¶ 138–143, 391).

Patent Owner characterizes Petitioner’s arguments as

modify[ing] Plassmann’s beamers that converge at a different distance than do Plassmann’s already-existing beamers, “including at predefined distances of 65 centimeters or 95 centimeters, as well as all distances in-between,” because Treuillet allegedly teaches that Plassmann has a depth of field (“DOF”) at 65–95 cm, and the prior art teaches imaging a subject at different distances using a single camera.

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PO. Resp. 32. Noting the importance of image focus to 3-D reconstruction of wounds and patient treatment, Patent Owner contends that a person of ordinary skill would not have had reason to modify Plassmann to purposely image at a distance of degraded focus and, in fact, would have been discouraged from doing so. *Id.* at 32–38.

Patent Owner asserts that a person of ordinary skill would understand that focus varies as the distance from the camera changes, including laterally, due to lens curvature and other physical properties. *Id.* at 35. As a result, the focus of a subject at the center of lens differs from the focus at a radial distance from the center, such that the image degrades as radial distance from the center increases. *Id.* Patent Owner further contends that Petitioner’s assertion there are many distances within Plassmann’s depth of field (DOF) sufficient to accurately image a subject is inconsistent with Plassmann’s because Plassmann teaches there is only one distance where the camera is focused and focus degrades at points away from that distance in any direction. *Id.* at 36 (citing Ex. 1007, 12; Ex. 2018, van der Weide Decl. ¶¶ 146–147, 151).

According to Patent Owner, all the references Petitioner cites expressly teach imaging at the optimally focused distance. *Id.* at 37–41. Patent Owner cites, for example, Treuilett’s discussion of MAVIS II as having beams of light that intersect at a single spot the “right distance” for the camera as providing optimal focus and the sharpest image. *Id.* at 37 (citing Ex. 1016, 755; Ex. 2018, van der Weide Decl. ¶ 154). According to Patent Owner “[b]y definition, all other distances are ‘the wrong distance.’” *Id.* (citing Ex. 2018, van der Weide Decl. ¶ 154).

Patent Owner argues that Petitioner’s reliance on Staller as providing a reason to modify Plassmann to place images at distances other than the

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optimum distance is improper because, unlike Staller's uncalibrated 2-D methodology, the scale of Plassmann's 3-D reconstruction is already known exactly from calibration and triangulation and the reconstructions can be viewed at any desired level of magnification. *Id.* at 40. Patent Owner contends, that as a result, there is no benefit derived by modifying Plassmann based on Staller's teachings. *Id.*

As Petitioner points out, however, Patent Owner does not deny that, to the extent that a stereophotogrammetry device is capable of taking adequate images within a depth of field sufficient to accommodate two distances, a person of ordinary skill would have found it obvious to use two pairs of intersecting beamers, such as disclosed in Staller, to denote those distances. Reply 17 (citing Ex. 1053, Supp. Otto Decl. ¶ 65; Ex. 1003, Otto Decl. ¶ 388; Ex. 1006, 5:56–6:2).

Patent Owner further contends that Petitioner's reliance on Treuilett as counseling positioning an imaging device at different distances does not apply to stereophotogrammetry devices, such as that taught by Plassmann, and results from Treuilett's particular imaging method, i.e., using only a standard handheld digital camera to obtain a single image at a time, requiring two images take at different distances at different times. *Id.* at 41 (citing Pet. 35; Ex. 2018, van der Weide Decl. ¶ 168). Patent Owner further argues that Treuilett does not vary distance based on wound size and location, but accounts for these factors by choosing the optical zoom factor of the lens to obtain the best framing. *Id.* (citing Ex. 1016, 756; Ex. 2018, van der Weide Decl. ¶¶ 167, 169).

Noting that Plassmann uses the term MAVIS (not MAVIS II), Patent Owner further contends that the record does not support a conclusion Treuilett's description of MAVIS II refers to the same device as Plassmann.

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PO Resp. 42. Petitioner notes that Plassmann's consistent use of the term MAVIS, without specifying the version of the device, and contends that a person of ordinary skill, would understand that MAVIS in Plassmann (Ex. 1007) also refers to the MAVIS II device. Reply 18–19 (citing Ex. 1054, Transcript of Deposition of Dr. Jean-Phillippe Thirion (Public Version) (“Thirion Tr.”) 87:23–25 (noting the inventor identified the device disclosed in Plassmann (Ex. 1007) as MAVIS II)).

Patent Owner further argues that Treuilett does not mention depth of field (DOF) and does not teach that MAVIS II had a DOF of ± 15 cm. Patent Owner contends that, because wounds are 3-dimensional, Treuilett's device must be able to image a volume of space around the right distance in order to accurately image, reconstruct, and measure wounds and that a person of ordinary skill would understand that imaging away from that right distance increases inaccuracy. PO Resp. 43–44 (citing Ex. 1016, 755; Ex. 2018, van der Weide Decl. ¶ 183). According to Patent Owner, even if Plassmann had a DOF of ± 15 cm, a person of ordinary skill would not modify Plassmann to add beamers at 65 and 95 cm because images at those distances would be degraded and inaccurate. *Id.* at 44 (citing Ex. 2018, van der Weide Decl. ¶¶ 185–186).

Petitioner points out that Patent Owner ignores Petitioner's arguments of distances between 80 and 120 cm. Reply 20 (citing Pet. 49–52). Petitioner further contends that Patent Owner misstates Petitioner's argument. i.e., that a person of ordinary skill would have understood the device depicted in Plassmann, like any stereophotogrammetry device, has a depth of field containing many distances at which the camera is focused and that Treuilett confirms that Plassmann's device has an extended depth of field sufficient to image a subject at multiple positions, included at

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predefined distances of 65 cm and 95 cm, as well as at distances in between.

Id. (citing Ex. 1053, Supp. Otto Decl. ¶ 74)

Patent Owner argues that Treuilett denigrates MAVIS II by calling it cumbersome and unsuitable and plainly criticizes MAVIS II for requiring prior careful calibration to take images at the right distance. *Id.* at 45.

Patent Owner states Treuilett touts that it can

take “free captured” “images at different distances” (*i.e.*, “successive camera positions” that are “unknown”) with “free-handled,” “free zooming” digital cameras, because its images are “uncalibrated,” “requiring no additional equipment or calibration.” Exs. 1016, 752, 755, 756; 2018 ¶189. MAVIS II’s “careful calibration” prevents its use for such free capture of images at different distances. Ex. 2018 ¶189.

Id. at 45–46. According to Patent Owner, “Treuillet’s criticisms are plainly directed to the “unsuitability” of MAVIS II for “taking images at different distances,” and would discourage POSITA from modifying Plassmann to do so. *Id.* at 46. Petitioner notes, however, that Plassmann-style handheld stereophotogrammetry continued to be used after Treulitt’s proposed improvement, notwithstanding the need to calibrate such devices for the nominal distances at which the subject is positioned. Reply 20–21 (citing Ex. 1016, 755; Ex. 1015 (“Hoeffelin”)¹¹; Ex. 1007).

Petitioner replies to Patent Owner’s arguments that a person of ordinary skill would not take images at distances other than the “optimal focus” distance by noting Dr. van der Weide’s acknowledgement that

¹¹ H. Hoeffelin, D. Jacquemin, V. Defaweux, and J L. Nizet, A *Methodological Evaluation of Volumetric Measurement Techniques including Three-Dimensional Imaging in Breast Surgery*, BioMed Research International Volume 2014 Hindawi Publishing Corp. (discussing testing of Patent Owner’s 3D LIfE Viz system).

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dermatologists and others employ numerous devices designed specifically to image subjects at multiple distances. Reply 14 (citing Ex. 1053, Supp. Otto Decl. ¶ 51); *see also* Ex. 2018, van der Weide Decl. ¶ 166 (acknowledging Treuilett describes a handheld camera taking two images at different distances from the subject at different times). Petitioner further points out that neither Petitioner nor its expert advocates combinations that take blurred photographs, i.e., photographs taken out of the depth of field. Reply 14 (citing Ex. 1053, Supp. Otto Decl. ¶ 62). Petitioner persuasively argues that, contrary to Dr. van Der Weide's assertions, the prior art does not teach a camera's focus must be as high as possible, but need only be located to provide images as sharp as necessary for the application to which the images are to be applied. *Id.* at 16 (citing Ex. 1053, Supp. Otto Decl. ¶ 62). Petitioner points out examples where persons of ordinary skill employ stereophotogrammetry devices to image non-optimally focused area, e.g. where if the leading edge of a face is positioned at an imaging device's focal plane much of the imaged face extends beyond that distance; similarly, when beams intersect on a subject's chest, the breast extends forward of the focal plane and the torso extends beyond it. *Id.* (citing Ex. 1053, Supp. Otto Decl. ¶¶ 61, 62; Ex. 1054, Thirion Tr. 72:4–15, 78:11–79:14).

Finally, as Petitioner notes, much of Dr. van der Weide's testimony concerning less than perfect focus emphasizes 3D reconstruction of anatomical surfaces and medical applications of stereophotogrammetry. Reply 16. The claims are not limited to such application requiring such precision. *Id.*

The preponderance of the evidence, as discussed above and as Petitioner identifies, best supports that a person having ordinary skill in the art would have found it obvious to modify Plassmann's

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stereophotogrammetry device, based on what was known in the art, to have multiple predefined positions for repeatability. Plassmann already teaches use of one pair of light beams for positioning, and a person having ordinary skill in the art would have understood that the Plassmann device could benefit from multiple pairs of light beams in the same way the Staller device benefits from multiple pairs of light beams to enable positioning at more than one repeatable distance from the camera.

Patent Owner does not offer any other substantive arguments concerning claim limitation 1.02. For the reasons discussed above, having reviewed the evidence and arguments of record, we find that Petitioner has demonstrated a person of ordinary skill would have had reason to combine the teachings of Plassmann, Treuilett, and Staller and that their combined teachings would have disclosed or suggested claim limitation 1.02 to such an ordinarily skilled artisan.

c) Objective Indicia

(1) Introduction

Objective indicia of nonobviousness may include long-felt but unsolved need, failure of others, unexpected results, commercial success, copying, licensing, industry praise, and expert skepticism. *Mintz v. Dietz & Watson, Inc.*, 679 F.3d 1372, 1379 (Fed. Cir. 2012). Objective indicia are only relevant to the obviousness inquiry if there is a nexus between the claimed invention and the objective indicia of nonobviousness. *In re Affinity Labs of Tex., LLC*, 856 F.3d 883, 901 (Fed. Cir. 2017). A rebuttable presumption of nexus applies only “when [a patent owner] shows that the asserted objective evidence is tied to a specific product and that product ‘embodies the claimed features, and is coextensive with [the claims].’” *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (quoting

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Polaris Indus. v. Arctic Cat, Inc., 882 F.3d 1056, 1072 (Fed. Cir. 2018)). On the other hand, a patent owner is not entitled to a presumption of nexus if the patented invention is only a component of a commercially successful machine or process. *Id.* (reaffirming the importance of the “coextensiveness” requirement).

Applying *Fox Factory*, the Board uses a two-step analysis in evaluating nexus between the claimed invention and objective evidence of nonobviousness, also referred to as secondary considerations. *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 33 at 33 (PTAB Jan. 24, 2020) (precedential). We consider whether Patent Owner has demonstrated “that its products are coextensive (or nearly coextensive) with the challenged claims,” resulting in a rebuttable presumption of nexus. *Id.* If not, that “does not end the inquiry into secondary considerations”; “the patent owner is still afforded an opportunity to prove nexus by showing that the evidence of secondary considerations is the ‘direct result of the unique characteristics of the claimed invention.’” *Id.* (quoting *Fox Factory*, 944 F.3d at 1373–75). For the reasons discussed below, we find that Patent Owner has not demonstrated that its products are coextensive with the challenged claims and has not demonstrated the requisite nexus with evidence that the secondary considerations are the direct result of the unique characteristics of the claimed invention.

(2) Coextensiveness

Patent Owner asserts that its LifeViz Infinity product “is disclosed and claimed in the [’]334 patent,” and that Petitioner does not dispute this assertion. PO Resp. 57 (citing Pet. 75–76). Accordingly, Patent Owner asserts it is entitled to a presumption of nexus of secondary considerations. *Id.* (citing *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1330 (Fed. Cir. 2016)).

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Patent Owner's mere allegation that its LifeViz Infinity product is covered by the claims of the patent is insufficient to establish the claims of the '334 patent and LifeViz Infinity are coextensive. Patent Owner cites the testimony of Dr. van der Weide that: "I have reviewed the LifeViz Infinity device and conclude that it embodies the invention of the ['']334 Patent. More specifically, the Infinity possesses all the features listed in claim 1 of the patent." *Id.* (citing Ex. 2018, van der Weide Decl. ¶ 213). Neither Patent Owner nor Dr. van der Weide offer any analysis that demonstrates the LifeViz Infinity product is coextensive (or nearly coextensive) with the challenged claims. *Id.*; *see also* 37 C.F.R. § 42.65(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.").

Moreover, Patent Owner's reliance on *WBIP* is misplaced. In that case, "WBIP presented evidence that specific products . . . [we]re embodiments of the invention as claimed in the asserted claims," and that provided a basis for finding a presumption of nexus. *WBIP*, 829 F.3d at 1329–31. Such is not the case here.

Patent Owner does not provide the analysis required to demonstrate that Infinity is coextensive (or nearly coextensive) with the challenged claims. PO Resp. 55; *Lectrosonics*, Paper 33 at 33. We, therefore, find that a presumption of nexus is inappropriate.

(3) *Direct result of unique characteristics of the claims*

In the second step of our analysis, we look to whether Patent Owner demonstrates the requisite nexus with evidence that any secondary considerations are the direct result of the unique characteristics of the claimed invention. We address below Patent Owner's arguments directed to

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the secondary considerations of (i) commercial success, (ii) copying, (iii) long-felt need, and (iv) praise for the invention. PO Resp. 57–68.

As an initial matter, we note that throughout its secondary indicia arguments, Patent Owner distinguishes between non-portable devices that can be used for imaging both facial and torso features, e.g. Patent Owner’s LifeViz products and Petitioner’s Vectra H1 products, and portable devices having such dual measurement capability, e.g. Patent Owner’s Infinity product and Petitioner’s Vectra H2 product. *See generally id.* Patent Owner’s emphasis of a long-felt need for a dual-measurement capability portable device and its creation of a new market for such a device, is not commensurate with the language of all the challenged claims of the ’334 patent. Although the Specification states that it discloses a “portable stereophotogrammetry device,” (e.g., Ex. 1022, 3:46), and a device and method “specifically intended to acquire with a single portable stereophotogrammetry camera views of subject at two distances” (*id.* at 11:43–46), the claims recite only a “[d]evice for stereophotogrammetry configured for an acquisition of two views according to two different angles” (*id.* at 11:54–55). Only claim 3 recites that the device is a portable system. Ex. 1022, 12:10–11. Neither party has proposed a construction that limits the remaining claims to a portable device or a device with a single camera.

Petitioner notes that Patent Owner’s long-felt need and commercial success arguments concern imaging both the face and body or fields of view that correspond to those surface areas. Reply 26. Accordingly, Petitioner points out that, because only claims 3, 4, and 11 recite imaging both the face and body, Patent Owner’s long felt need arguments are relevant to the subject matter of claims 3, 4, and 11 of the ’334 patent, at most. *Id.* Patent

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Owner does not address claims 3, 4, and 11 specifically. Petitioner further points out that Patent Owner's evidence and arguments do not demonstrate the existence of a long-felt need addressed by the any of subject matter recited in the challenged claims prior to Patent Owner's introduction of its commercial product. *Id.* at 26–27. The Petition does not discuss LifeViz Infinity, except to point out that Petitioner's expert witness, Dr. Otto, is active in the relevant market and has not seen widespread commercial success, consumer acclaim, or industry praise of LifeViz. Pet. 75–76 (citing Ex. 1003, Otto Decl. ¶¶ 437–439 (noting that Patent Owner alleges LifeViz Infinity is covered by the claims of the U.S. Patent No. 10,070,119 B2 (“the ’119 patent”)¹², U.S. Patent No. 10,163,253 B2 (“the ’253 patent”)¹³, and the ’334 patent that this is the subject of this proceeding)).

As discussed further below, even in the context of claims drawn to a portable, dual distance imaging stereophotogrammetry device, Patent Owner has not provided sufficient evidence that secondary considerations are the direct result of the unique characteristics of the claimed invention

(a) Long-Felt Need

Patent Owner argues that the invention claimed in the ’334 patent addresses a long-felt need. PO Resp. 57–61; Sur-reply 26. Patent Owner acknowledges that in the mid-2000s Dr. Plassmann developed MAVIS II, a system with a pair of light beamers that converge at a distance coinciding with the focal plane of the device at which the image is to be take. PO Resp.

¹² See *Canfield Scientific, Inc. v. QuantifiCare S.A.*, IPR2021-01511, Paper 61 (PTAB March 9, 2023) (Final Written Decision, finding all challenged claims (claims 1–4 and 8–11) unpatentable).

¹³ See *Canfield Scientific, Inc. v. QuantifiCare S.A.*, IPR2021-01518, Paper 61 (PTAB March 9, 2023) (Final Written Decision, finding all challenged claims (claims 1–4, 8–12, 15, 16 and 20–23) unpatentable).

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59. Patent Owner also states that in 2007, it “developed and launched the LifeViz stereophotogrammetry camera,” a device that was “[s]imilar to MAVIS II” and “was a portable, handheld, single camera device with one pair of beamers converging at the focus distance of the camera, and subjects were imaged at that distance.” *Id.* (citing Ex. 2024, Declaration of Dr. Jean-Phillipe Thirion (“Thirion Decl.”) ¶¶ 9–12). Patent Owner states that “LifeViz was configured and marketed for imaging faces” and its experimental use of LifeViz for imaging at distances of 100 cm or more did not provide sufficient resolution for aesthetic and cosmetic purposes. *Id.* (citing Ex. 2024, Thirion Decl. ¶¶ 20–21).

According to Patent Owner “[a]t the time of invention [of the ’334 patent], there were no portable, ‘all-in-one’ handheld stereophotogrammetry devices for imaging both face and breast/torso.” *Id.* at 60 (citing Ex. 2024, Thirion Decl. ¶¶ 25–26, 29). “To image both, practitioners had to purchase one device for face and one for breast/torso, or purchase the large, costly multi-head Canfield XT,” which Patent Owner contends had disadvantages. *Id.* (citing Ex. 2024, Thirion Decl. ¶¶ 25–26, 29; Ex. 1001, 1:49–52).

Patent Owner argues that “[a]ccordingly, since at least the 2007 introduction of LifeViz, there was a long-felt need for a portable single-camera stereophotogrammetry device that avoided the disadvantages of purchasing multiple devices or a multi-head device like the Canfield XT.” *Id.* (footnote omitted) (citing Ex. 2018, van der Weide Decl. ¶ 212; Ex. 2024, Thirion Decl. ¶ 30; Ex. 2025, 4). According to Patent Owner, “[t]o address that deficiency, [Patent Owner] developed Infinity in 2015, filed for a patent thereon on October 14, 2015, and began commercial sales one year later.” *Id.* at 60–61 (citing Ex. 2024, Thirion Decl. ¶¶ 28–29).

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Patent Owner contends that its Infinity product satisfied a long-felt need, as demonstrated by industry praise and commercial success. *Id.* at 61 (citing Ex. 2024, Thirion Decl ¶ 30; Ex. 2025, 4). Patent Owner cites the deposition testimony of Petitioner’s chief technology officer, Dr. Otto, that “it ‘was desired to do breast imaging,’ there was ‘a big demand’ to image ‘both areas,’ and [Petitioner] ‘didn’t want to have a separate product to do breast imaging.’” Sur-reply 26 (citing Ex. 2042, Transcript of October 21, 2022 Deposition of Dr. Paul Otto (“Otto Tr.”) 17:22–18:17). In contrast to demonstrating a long-felt need, however, when taken in context, Dr. Otto’s testimony merely suggests the logical development of a market niche. *See* Ex. 2042, Otto Tr. 18:4–17 (testifying that Petitioner “had for years been making products - - non-portable products which did both face and breast imaging,” that Petitioner “had already developed the H1 portable device which did face imaging, and that was very successful, so there came a question of what next,” and “we didn’t want to have a separate product to do breast imaging, so we thought, okay, how do we do face and breast?”).

“[L]ong-felt need is analyzed as of the date of an articulated identified problem and evidence of efforts to solve that problem.” *Texas Instruments Inc. v. U.S. Int’l Trade Comm’n*, 988 F.2d 1165, 1178 (Fed. Cir. 1993).

Although Dr. Thirion testifies to the capabilities of the 2007 LifeViz product, Patent Owner does not provide evidence showing that the LifeViz product’s single pair of beamers converging at one distance was considered a problem needing solution in 2007. *See* Ex. 2024, Thirion Decl. ¶¶ 9–12. Instead, Patent Owner’s evidence demonstrates that separate commercial products were available to image facial features and breast features. *Id.* ¶¶ 21, 25–26. Patent Owner’s unsuccessful experimentation with certain non-commercial products, does not, by itself, demonstrate the industry

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perceived a long felt need for a product, such as Infinity. PO Resp. 59–60 (citing Ex. 2024 ¶ 20). The incorporation of additional dual distance measurement capabilities into the later generation Infinity product does not evidence the industry perceived a long-felt need that Infinity met. Patent Owner does not provide evidence showing an articulated, identified problem and efforts to solve that problem. Nor does Patent Owner provide evidence that Infinity was met with skepticism or that persons of ordinary skill in the art tried and failed to achieve the claimed invention.

In addition, we are not persuaded by Patent Owner’s attempt to bootstrap its alleged industry praise and commercial success arguments into a demonstration of a long-felt need for the claimed invention. Both commercial success and industry praise can result from exploiting a newly created market niche without the existence of a long-felt need for the claimed subject matter. *See* Ex. 2024, Thirion Decl ¶ 30 (testifying that Infinity created a new market for sales, but not providing direct evidence that a long-felt need had existed in the industry); Ex. 2025, 4 (stating that Infinity “is the first portable 3D imaging system capable of capturing face, body, and breast areas thanks to two sets of dual beamer pointers which allow for two distance settings,” but without stating it met a long-felt need). As discussed above, contrary to Patent Owner’s assertions, Dr. Otto’s deposition testimony is evidence of a logical market development for products with progressively improving capabilities, rather than evidence of an unsolved long-felt need solved by the claimed subject matter. Ex. 2042, Otto Tr. 17:22–18:17.

Patent Owner’s long-felt need based on commercial success arguments are also unavailing. That sales of Patent Owner’s traditional line of products have not been reduced by its introduction of its Infinity dual

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distance product suggests the absence of a long-felt need because its existing products are adequate to meet the needs of the current market, i.e., (i) there has not been a rush to substitute Infinity for the base of installed products and (ii) Infinity sales did not “eat into” current Life Viz Mini or Body sales. *See* PO Resp. 64 (citing Ex. 2025, 4; Ex. 2024 ¶ 36 (“sales of LifeViz Infinity have not significantly impacted sales of its single-distance devices. Rather sales of these devices regularly increased, year by year.”)).

In sum, Patent Owner does not offer sufficient evidence to show a long-felt need solved by the claimed subject matter. Thus, we find that Patent Owner has not shown the requisite nexus between the purported long-felt need and the unique characteristics of the claimed invention.

(b) Praise

Patent Owner begins its industry praise argument by reiterating its assertion that Infinity embodies the invention disclosed and claimed in the ’334 patent and therefore a nexus is presumed. PO Resp. 61 (citing *WBIP*, 829 F.3d at 1330). We find this argument unavailing for the same reasons as those discussed above, i.e., Patent Owner does not demonstrate that a presumption should attach because Patent Owner does not show coextensiveness. *See supra* Section VI.F.1.c.3.a.

Patent Owner also argues Infinity’s receipt of a prestigious award, the 2018 EuroMediCom Best Aesthetic Device Award, establishes nexus based on industry praise. PO Resp. 61 (citing Ex. 2024, Thirion Decl. ¶ 33); Ex. 2025, 1, 4 (announcing LifeViz Infinity as a 2018-2019 Industry Winner for Best Aesthetic Device). Petitioner contends that persons of ordinary skill would know that the subject award may not be an unbiased demonstration of industry praise, as only that subset of industry participants who make a

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payment to EuroMediCom are eligible to be considered for such awards.

Ex. 1053, Supp. Otto Decl. ¶¶ 76–78.

Patent Owner quotes three portions of the EuroMediCom announcement, and argues that “[t]his praise is squarely directed to the claimed invention.” PO Resp. 61–62 (citing Ex. 2025, 4; Ex. 2018, van der Weide Decl. ¶ 214).

Below we reproduce the entirety of the announcement, italicizing the portions Patent Owner quotes in its Response.

The LifeViz® Infinity is the first portable 3D imaging system capable of capturing face, body, and breast areas thanks to two sets of dual beamer pointers which allow for two distance settings. This unique system has two acquisition modes. A tripod mounted camera and turntable quickly capture a 360° 3D body image. Eight images are automatically taken and seamlessly stitched to produce a “life-like[”] 3D image of the body for visualization by the physician and patient. In hand-held mode, the camera is capable of generating 3D images of face and breast to simulate procedures and photo-document before/after interventions, without blocking an entire exam room with cumbersome equipment.

With a simple flip of a switch, dual beam pointers adjust to the distance ideal for face or body applications without the need for cumbersome repositioning and/or multi-headed systems. Superior image quality has been achieved by improving the optic performance. The LifeViz® Infinity produces excellent pictures from both near and far thanks to an increased deep field of view. Finally, a powerful external flash removes the need for specific lighting conditions and additional equipment ensuring reproducible images from one session to the next. The LifeViz® Infinity is comprised of a portable stereovision camera, a software suite including an image database, 3D viewer tool, 3D skin analysis, face, breast, and body measurements and simulation modules. All aspects of 3D documentation, comparison, simulation, and measurement ranging from medical to cosmetic applications are possible with this single unique device.

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Ex. 2025, 4 (*italics emphases added*). The announcement broadly describes the Infinity product, including many additional features that the Patent Owner Response does not discuss, including “a tripod mounted camera and turntable”; “[e]ight images are automatically taken and seamlessly stitched to produce a ‘life-like’ 3D image of the body for visualization”; “a powerful external flash”; and “a software suite including an image database, 3D viewer tool, 3D skin analysis, face, breast, and body measurements and simulation modules.” *Id.*

As the announcement touts many features of Patent Owner’s Infinity product, we cannot assess whether praise for Patent Owner’s product is grounded in a claimed feature, or other features, or a combination thereof. Patent Owner does not directly compare the announcement with the challenged claims, and does not clearly identify what Patent Owner contends are the unique characteristics of the claimed invention being praised. Moreover, the challenged claims are of varying scope, and Patent Owner does not address those differences. Accordingly, Patent Owner does not show that the purported praise in the form of the Euro Medi Comm recognition is a direct result of the unique characteristics of the claimed invention.

The Patent Owner Response also cites the comments of three medical professionals’ as evidence of “praise [is] directed to the claimed invention.” PO Resp. 62 (citing Ex. 2026,¹⁴ 11, 19–20). In particular, Patent Owner quotes from Dr. Baie-Bong Lee’s testimonial that “[a]lthough regular 2D pictures are inconvenient, capturing a face or body in 3D with the 3D

¹⁴ *Testimonials: What our customers say*, QuantifiCare, available at <https://www.quantificare.com/learn/testimonials/>; see also *id.* at 2, 8, 10, 17 for addition citations by Patent Owner.

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LifeViz® Infinity is easier. First of all, you have a unique device for standardized photography with a switch that adjusts the ideal distance for face and body.” *Id.* (citing Ex. 2026, 19). Patent Owner does not relate this portion of Dr. Lee’s testimonial to the ’334 patent claims, and fails to show that the purported praise is a direct result of the unique characteristics of the claimed invention.

Patent Owner also quotes the testimonial of Dr. Kian Karimi who describes Infinity as “a state of the art, easy to use photographic system that has become an essential part of our consultation for face and body procedures.” *Id.* (citing Ex. 2026, 20). Describing Dr. Myriam Fopp as one who “uses LV Infinity for face (‘Wrinkles, Pores’) and body,” Patent Owner quotes Dr. Fopp as stating that “[w]e also use our LifeViz® Infinity technology for body treatments.” *Id.* (citing Ex. 2026, 11). None of the subject matter Patent Owner quotes from Dr. Karimi and Dr. Fopp concerns the limitations of the ’334 patent claims.

Patent Owner’s reference to the testimonials of Drs. Lee, Karimi and Fopp is unavailing because Patent fails to show that the purported praise is a direct result of the unique characteristics of the invention claimed in the ’334 patent claims. Based on record as a whole, the evidence of industry praise, is insufficient to support non-obviousness.

(c) *Commercial Success*

Patent Owner begins its commercial success argument by reiterating its assertion that Infinity embodies the invention disclosed and claimed in the ’334 patent and therefore a nexus is presumed. POResp. 63 (citing *WBIP*, 829 F.3d at 1330). We find this argument unavailing for the same reasons as those discussed above, i.e., Patent Owner does not demonstrate that a presumption should attach because Patent Owner does not show

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coextensiveness. *See supra* Section VI.F.1.c.3.a. Therefore, we consider whether Patent Owner demonstrates the requisite nexus with evidence that commercial success is the direct result of the unique characteristics of the claimed invention

For commercial success indicia to support nonobviousness, Patent Owner must “show both commercial success and that a nexus exists between that success and the merits of the claimed invention.” *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1350 (Fed. Cir. 2012). In contrast to its long-felt need arguments, Patent Owner argues commercial success demonstrates “Infinity created a new market in the industry – portable stereophotogrammetry systems for aesthetic and cosmetic fields that could adequately image at more than one distance, *e.g.*, the face and body for medical procedures.” PO Resp. 63–64 (citing Ex. 2024, Thirion Decl. ¶¶ 35–36). As we addressed in our discussion of long-felt need, a market for stereophotogrammetry systems that image at two distances and for portable stereophotogrammetry already existed. *See* Section VI.F.1.c.3.a herein. In its commercial success arguments, Patent Owner limits the market to portable systems that image at two distances and argues the following evidence of commercial success demonstrates the invention accounts for 100% of the sales in that new market: (1) Infinity sales did not reduce sales of Patent Owner’s other products (LifeViz Mini or Body), and (2) Patent Owner controlled 100% of the market prior to Petitioner’s introduction of its H2 product, *i.e.* the only other product in that market. *Id.* at 64–65.

Patent Owner’s commercial success arguments fall short for at least two reasons. First, Patent Owner’s attempt to define a new market (or at least a new sub-market or market segment) limited to portable

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stereophotogrammetry devices that image at two distances does not sufficiently tie the sales of its Infinity product to the claims of the '334 patent to that market. Aside from general allegations that Patent Owner and Petitioner are the only two entities marketing portable systems that image at two distances, Patent Owner's commercial success arguments do not tie its sales of Infinity LifeViz to the claims of the '334 patent.

Second, Patent Owner presents no evidence concerning the market itself. Patent Owner's contention that it initially controlled 100% of the market does not reflect success, but is the natural result of Patent Owner being the first entrant in the market it defines. As Patent Owner presents no arguments concerning the size of the market, e.g., the number of unit sales or the dollar amounts of such sales, there is no evidence as to the scope of the alleged commercial success. Although Patent Owner states that its sales of LifeViz Infinity increased substantially from 0% to 44% of its total sales revenue and is substantially less expensive than Vectra products, Patent Owner does not disclose its total sales, its unit sales, or other information concerning the size of the market. *Id.* at 63 (citing Ex. 2024, Thirion Decl. ¶¶ 30, 35). For example, because Patent Owner provides no evidence concerning the size of the market, we cannot assess whether Patent Owner's alleged success or dominance stems from the market being too small to accommodate additional entrants. Patent Owner also does not address whether other forces, such as up-front investment cost to enter the market segment Patent Owner defines, is a prohibitive barrier, thereby shutting out additional competitors and leaving a larger market share to Patent Owner.

We are also not persuaded by Patent Owner's attempt to bootstrap its alleged industry praise argument into its commercial success argument, by asserting that "customers have identified claimed features as important to

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their use of the invention.” *Id.* (citing *id.* at 61–62 (arguing that the claimed invention has received praise)). These arguments do not address whether any sales, for example, of the Infinity product, resulted from the merits of the claimed invention, or that such purported praise led to actual demand.

We also find unavailing Patent Owner’s argument that “Infinity sales were due to claimed features of the invention, *e.g.*, its ‘dual-distance’ functionality, which permitted customers to avoid buying multiple products or a non-portable multi-head system to accomplish the same tasks – as was noted by the Euro Medi Comm press release.” *Id.* at 64 (citing Ex. 2025,¹⁵ 4). The Euro Medi Comm announcement discussed above identifies the Infinity product as “BEST AESTHETIC DEVICE,” and describes the product, but does not evidence any specific demand for, or sales of, the Infinity product due to any features of the challenged claims. *See* Ex. 2025, 4. Patent Owner also does not sufficiently address whether dual-distance functionality comprises the unique characteristics of the claimed invention.

We also find unavailing Patent Owner’s arguments that Petitioner’s sales of its H2 products relative to its H1 products demonstrates commercial success relative to the claims of the ’334 patent. PO Resp. 65. Patent Owner contends that “[t]he primary functional difference between [Petitioner’s] H2 and H1 [products] is that H2 can image the body (at a different distance) in addition to the face,” and that “[i]t follows that the large differential in production of the H2 as compared to H1 is due to that additional functionality.” *Id.* (citing Ex. 2039¹⁶ (arguing that Vectra H1

¹⁵ *Winners 2018-2019*, EuroMediCom (Jan. 29, 2021) <https://www.euromedicom.com/mca-2018/en/trophy/Winners-2018-2019.html>.

¹⁶ *Vectra H1 Quick Reference Guide*, Canfield (2014).

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images face only); Ex. 2035¹⁷ (arguing that Vectra H2 captures a face or body image). Patent Owner's assertion is mere speculation unsupported by evidence. Patent Owner's analysis fails to consider other possible factors. For example, Petitioner argues that its H2 product has different technical features, such as the ability to refocus at different distances in a manner similar to multiple head prior art devices like the Polaroid MACRO. Reply 19 (citing Ex. 1053, Supp. Otto Decl. ¶¶ 79–81); *see also* Ex. 2041 (2018 H2 Vectra Guide discussing focusing for face, breast, and body imaging); Pet. 36–37; PO Resp. 38.

We also find unavailing Patent Owner's argument that Petitioner "does not contest that its H2 infringes, and thus its sales are relevant to the invention's commercial success." Sur-reply 25 (citing *Truswal Sys. Corp. v. Hydro-Air Eng'g, Inc.*, 813 F.2d 1207, 1215 (Fed. Cir. 1987)) & n. 12 (citing Ex. 2018, van der Weide Decl. ¶¶ 215–219). Patent Owner's reliance on *Truswal* misplaced. First, we note that Patent Owner cites to Judge Rich's dissent in *Truswal*. Second, Judge Rich stated the "once an infringer is sued *and proved to be an infringer*, its sales are appropriately proved and added to the others," and that "[i]t is necessary to establish that the alleged copies are actual infringements of the patent in suit before they can possibly be relevant and counted as successes *of the patented invention*." *Truswal*, 813 F.2d at 1215 (Rich, J., dissenting). Although Patent Owner alleges that H2 infringes, Petitioner has not been adjudged to infringe. We do not decide infringement in this forum and we find insufficient support for Patent Owner's assertion that Petitioner does not contest infringement.

¹⁷ *Vectra H2: Capturing a FACE or BODY image*, Canfield.

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In sum, we find that Patent Owner does not show sufficient nexus between the purported commercial success and the claimed invention, and fails to show commercial success.

(d) *Copying*

Patent Owner argues that Petitioner’s Vectra H2 “is a copy of *the invention*, in structure, function, operation, and use.” PO Resp. 66–68 (emphasis added). According to Patent Owner, Petitioner’s Vectra H2 mimics patented features of Infinity and unpatented color coding features, i.e., the use of red light beamers for closer imaging of the face and green light beamers for farther imaging of the torso. *Id.* at 66. Patent Owner also notes that Petitioner launched its H2 device “[e]ighteen months after [Patent Owner] launched its Infinity.” *Id.*

Petitioner replies that it did not copy Patent Owner’s invention and states that technical distinctions exist between Patent Owner’s purported invention and Petitioner’s Vectra H2 product. Reply 29 (citing Ex. 1053, Supp. Otto Decl. ¶¶ 79–81). Petitioner also states that its Vectra H2 can refocus at different distances, a design feature in prior art systems, e.g. Polaroid’s MACRO devices, that Patent Owner acknowledges is distinct from its invention. *Id.* at 29–30 (citing Ex. 1054, Thirion Tr. 127:6–128:17). As to the unpatented beamer colors, Petitioner’s expert, Dr. Otto, credibly testifies that Petitioner’s choice of red and green light beamers was made for functional reasons (it is easier to get bright LEDs in red and green than in other colors). *Id.* (citing Ex. 1053, Supp. Otto Decl. ¶¶ 80–81).

Notwithstanding similarities between the Patent Owner’s and Petitioner’s products, Patent Owner lacks sufficient evidence that Petitioner copied the ’334 patent or any claim of the ’334 patent. Patent Owner cites no evidence, for example, that Petitioner was aware of the ’334 patent

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during development of the H2 device. *See* Ex. 2042, Otto Tr. 19:5–16, 157:7–16 (Dr. Otto testifying that he was unaware of Patent Owner’s Infinity product at the time he worked on Petitioner’s H2 product). Patent Owner further lacks evidence that any particular aspect of the ’334 patent was copied. *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995) (“[M]ore than the mere fact of copying by an accused infringer is needed to make that action significant to a determination of the obviousness issue.”) (citation omitted).

Patent Owner also lacks evidence that Petitioner copied any patented product. As we explain above, Patent Owner lacks evidence that the Infinity product is coextensive or nearly coextensive with any challenged claim; the record, thus, does not establish that Infinity is a “patented product” in a relevant sense.

“Copying requires evidence of efforts to replicate a specific product, which may be demonstrated through internal company documents, direct evidence such as disassembling a patented prototype, photographing its features, and using the photograph as a blueprint to build a replica, or access to the patented product combined with substantial similarity to the patented product.” *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010). Patent Owner lacks evidence that Petitioner studied any Patent Owner product or documents when developing the H2 device. To the contrary, the preponderance of the evidence supports that Petitioner’s H2 product differs from Patent Owner’s product, including because it refocuses at different distances (a design present in prior art systems). Ex. 1053, Supp. Otto Decl. ¶¶ 79–81; *see also* Reply 29.

Thus, based on the record as a whole, Patent Owner’s allegation of copying is unpersuasive and does not support non-obviousness.

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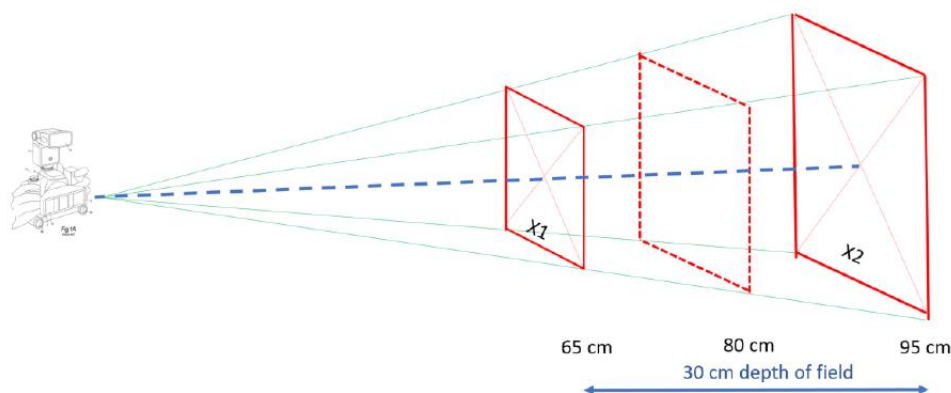
(4) Conclusion

Having considered the arguments and evidence of record we find that Patent Owner has not demonstrated that the claims are coextensive with any of its products and that Patent Owner has not demonstrated that the secondary considerations are the direct result of the unique characteristics of the claimed invention.

2. Claims 11 and 12

Claim 11 depends from claim 1 and recites that the closer distance position (A4) and the farther distance position (A3) are such that the surface of the field of view corresponding to the farther distance position (A3) is at least 25% larger than a surface of a field of the view corresponding to the closer distance position (A4). Accordingly, Petitioner notes that claim 11 recites two predefined distances where the surface of a field of view differs in the area by at least 25%. Pet. 47.

The Petition includes the illustrative figure shown below.



Id. at 48 (citing Ex. 1003, Otto Decl. ¶ 285). Petitioner states that the figure illustrates rectangular areas X1, X2 for the MAVIS device disclosed in Plassmann and Treuilett, with the closest and farthest distance is falling within its 30 cm depth of field. *Id.* Petitioner notes that as one moves further from the device shown on the left, the imaged area gets larger, such

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that X2 is always larger than X1 and contends that a farther position imaging at least 25% more than a closer position would have been obvious. *Id.* (citing Ex. 1003, Otto Decl. ¶ 285).

Petitioner notes that Plassmann and Treuilett both disclose using the Plassmann device to monitor wounds and that a person of ordinary skill would have been familiar with the principle that photographic devices used for that purpose employ multiple, predefined distances closer in position that differ in magnification from its farthest position by more than 25%. *Id.* at 48–49 (citing Ex. 1017; Ex. 1003, Otto Decl. ¶ 286). Although neither Plassmann nor Treuilett discloses the actual focal length of their lenses, Dr. Otto states that a person of ordinary skill would understand such devices may be used with any lens suitable to the subject. *Id.* at 50 (citing Ex. 1003, Otto Decl. ¶ 290). Dr. Otto confirms that devices of Plassmann’s design employing 34 mm focal length lenses could provide a 30 cm depth of field centered at 80 cm distance sufficient to encompass a field of view roughly equivalent to the A4 format and one equivalent to the A3 format (i.e., differing by more than 25%). *Id.* at 49–50 (citing Ex. 1003, Otto Decl. ¶¶ 288–292). Dr. Otto further testifies that a person of ordinary skill would know that employing dual 34 mm lenses allows configuration of the device to encompass a field of view a fraction larger than A4 at 65 cm from the device and in the field of view of A3 at 93.9 cm, both within the depth of field reported in Treuilett, whose fields of view differ in size by more than 25%. *Id.* at 50 (citing Ex. 1003, Otto Decl. ¶¶ 160–172, 292).

Petitioner further contends that a person of ordinary skill would have known of prior art publications describing the use of hand-held devices with similar dual-optic designs suitable for imaging the face and body, e.g., the LifeViz II device that can have a depth of field extending 80–120 cm. *Id.* at

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51 (citing Ex. 1015, noting LifeViz II permitted distortion free consistent imaging within a 40 cm range). Patent Owner contends that Petitioner's reference to LifeViz II (and Hoefflin) as a single device that could image face and torso is incorrect. PO Resp. 51–54. Even if Patent Owner is correct that Petitioner mis-identified LifeViz II and Hoefflin as a dual-optic design, Petitioner argues that a person of ordinary skill would have known that the device described in Plassmann and Treulitt could be configured with various lenses and different focal lengths and depths of field (e.g., by adjusting the aperture setting of the lens) at various distances as needed to image particular subjects and to configure such devices to define closer and farther imaging positions, where the area of the subject recorded at the farther position is at least 25% larger than at the closer position, as claimed. Pet. 52 (citing Ex. 1003, Otto Decl. ¶ 172).

Patent Owner argues that neither Plassmann nor Treulett identifies or discusses field of view and that Dr. Otto's model is incorrect. PO Resp. 47–49 (citing Ex. 2018, van der Weide Decl. ¶¶ 195, 203). According to Patent Owner, Dr. Otto's model is based on a single pyramidal view frustum extending from the centerline of the camera and within that frustum Petitioner depicts the supposed field of view at a distance from the camera as a rectangular area perpendicular to the centerline. *Id.* (citing Ex. 2018, van der Weide Decl. ¶ 106). Patent Owner contends that Dr. Otto's model is flawed because a stereophotogrammetry camera is not a singular frustum, as discussed by Dr. Otto, but the intersection of two separate view frustums of the sub-optics, and the field of view at a particular distance from the camera is defined by the intersection of those two frustums at that distance. *Id.* (citing Ex. 2018, van der Weide Decl. ¶ 197). According to Patent Owner,

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Dr. Otto's model results in locations where the subject is not imaged at all. *Id.* at 50; Ex. 2018, van der Weide Decl. ¶ 198.

Petitioner characterizes Patent Owner's argument as "assert[ing] that the calculations fail to account for monocular areas where the fields of view of the two suboptics do not overlap." Ex. 1053, Supp. Otto Decl. ¶ 67 (citing Ex. 2018, van der Weide Decl. ¶¶ 196–198) and that these monocular areas are insignificant. Patent Owner denies that Dr. van der Weide discussed monocular areas, but argued "rather that a stereophotogrammetry device's field-of-view is more limited than a single-view system," particularly in non-parallel systems, like those of the invention, where the crisscrossing pyramidal views first coverage/overlap and then diverge and cease to overlap at certain distances from the camera, after which there is no stereo field of view at all. Sur-reply 22–23 (citing Ex. 2018, van der Weide Decl. ¶¶ 197–198, 104, referencing Patent Owner's annotated Figure 2 of the '334 patent). We note, however, that Patent Owner extensively discusses parallel configuration with a monocular area to the left and right of the stereoscopic binocular area in the center. *See* PO Resp. 5–6 (including a similar figure as that shown on page 50 of the Response); Ex. 2018, van der Weide Decl. ¶ 68. Petitioner emphasizes that for angled sub-optics, such as those in Plassmann, the dimensions of this monocular area would be insignificant and did not need to be addressed in Dr. Otto's illustrative calculations and that Dr. van der Weide does not assert that configuration as described by Otto (or others a person of ordinary skill would have routinely configured) would not have been capable of meeting the requirements of claim 11. Reply 22 (citing Ex. 1053, Supp. Otto Decl. ¶ 68).

For purposes of assessing the recitation in claim 11 that the surface of a field of view at farther distance A3 is 25% larger than at closer distance

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A4, we need not decide the merits of the parties competing contentions concerning single or intersecting pyramidal frustums. We understand Dr. Otto's discussion merely to be illustrative of the principle that as one moves farther from the device, the imaged area is larger. Pet. 47–48. As neither party disputes this principle, we turn our attention to their remaining arguments concerning claim 11.

Patent Owner contends that Petitioner fails to consider the degradation in sharpness laterally from the optical axis. PO Resp. 50. Petitioner contends this effect is negligible. Reply 22. Neither party provides a detailed analysis of this effect. In any case, the degree of sharpness is not a limitation recited in claim 11; we direct our attention to whether a person of ordinary skill would have understood that the surface image at farther distance A3 is larger than at closer distance A4.

As discussed above, Dr. Otto contends that a person of ordinary skill would recognize that common 34 mm and 42 mm lenses could be employed to permit imaging at two distances where the surface field of view at the further distance exceeds that of the closer distance by at least 25%. *See also* Reply 23. Petitioner disputes Patent Owner's contentions that Dr. Otto failed to consider the apertures available for such lenses and that apertures that would permit such imaging are not available; Petitioner argues that most lenses come with a wide range of apertures suitable for such use. *Id.* Except to argue that Petitioner did not previously argue that Hoefflin employed an available aperture, Patent Owner does not reply to these arguments. *See* Sur-reply 24. Instead, Patent Owner contends that Petitioner summarily concludes a person of ordinary skill would understand how to select "unknown optical characteristics" missing from Dr. Otto's analysis. As discussed above, Petitioner acknowledges that neither Plassmann nor

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Treuilett discloses the actual focal length of their lenses, but Dr. Otto states that a person of ordinary skill would understand such devices may be used with any lens suitable to the subject. Pet. 50. We agree with Petitioner that Dr. Otto's testimony provides sufficient reasoning with rational underpinning to support the proposition that a person of ordinary skill in the art would have known how to select the requisite lenses to achieve the results recited in claim 11. *See KSR*, 550 U.S. at 418 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring "articulated reasoning with some rational underpinning to support the legal conclusion of obviousness"))).

Having considered the arguments and evidence of record, for the reasons discussed above, we find that Petitioner has demonstrated that a person of ordinary skill would have had reason to combine the teaching of Plassmann, Treuilitt, and Staller and that their combined teachings would have disclosed or suggested the subject matter of claim 11 to a person of ordinary skill.

Claim 12 depends from claim 11 and recites fields of view at closer position (A4) equal to an A4 surface format, plus 100% or minus 40%, and the farther position (A3) equal to an A2 surface format, plus 100% or minus 40%. Citing its arguments concerning claim 11, Petitioner argues that it would have been within the routine skill of an ordinarily skilled artisan to configure a variety of lens configurations using Plassmann's device to provide various fields of view, including ones with the claimed dimension, to capture the larger areas of a subject's body. Pet. 53–56. Patent Owner repeats its assertions that Dr. Otto's analysis of claim 12 is flawed. PO Resp. 56–57. For similar reasons as those we articulated concerning claim 11, we find that Petitioner has demonstrated that a person of ordinary skill

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would have had reason to combine the teaching of Plassmann, Treuillitt, and Staller and that their combined teachings would have disclosed or suggested the subject matter of claim 12 to a person of ordinary skill.

3. *Claims 2–5, 9, 10, 15, 16, and 20*

Claims 2–5, 9, 10 and 12 are device claims that depend directly or indirectly from claim 1. Claims 15, 16, and 20 directly or indirectly recite a method using the device recited in claim 1. We have reviewed Petitioner’s arguments and evidence regarding these claims. Patent Owner does not address these claims separately and has waived argument concerning them. Based on the arguments and evidence of record, we find that Petitioner has demonstrated that a person of ordinary skill would have had reason to combine the teachings of Plassmann, Treuilett, and Staller and that the combined teachings of these references would have disclosed or suggested the limitations of claims 2–5, 9, 10, 15, 16 and 20 to an ordinarily skilled artisan.

G. *Claims 21–23 As Obvious Over Plassmann, Treuillet, Staller and Peng*

Claims 21–23 are method claims that depend directly or indirectly from claim 15. Claim 15 recites a method of using the device recited in claim 1. Claims 21–23 are directed to reconstructing 3-D dimensional surface of the target subject. *See* Ex. 1022, 14:48–15:19. Petitioner observes “[t]he ’334 patent does not explain how POSITA is to perform these steps, stating only such processing be performed ‘by a program in a computer’” and “[t]he use of a stereo-pair of images to reconstruct a 3-Dimensional surface would have been well-known to POSITA—this is the primary purpose in stereophotogrammetry for such image pairs.” Pet. 61, 63 (citing Ex. 1022, 7:42–47; *see also id.* at 10:38–48; Ex. 1003, Otto Decl.

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¶¶ 334, 428). Nevertheless, noting that Peng “discusses methods for ‘3D model stitching for adjacent scenes’ from multiple stereo-pairs . . . by spatially matching at least three noncollinear points between different 3D models,” Petitioner cites Peng as “disclos[ing] reconstruction of comprehensive 3D geometries using passive, image-based methods, such as those referred to in Plassmann and Treuillet.” *Id.* at 66–67 (citing Ex. 1009, 1–6; Ex. 1003, Otto Decl. ¶¶ 342, 346, 428).

Patent Owner does not address claims 21–23, except to argue that Peng does not cure the deficiencies Patent Owner pointed out with respect to claim 1. PO Resp. 68.

Having considered all the arguments and evidence of record, we find that Petitioner has demonstrated that a person of ordinary skill would have had reason to combine the teachings of Peng with those of Plassmann, Treuillet and Staller and that their combined teachings would have disclosed or suggested the limitations of claim 21–23 to such an ordinarily skilled artisan.

VII. MOTION TO EXCLUDE

Patent Owner’s Motion to Exclude seeks to exclude two areas of evidence. We address each in turn.

A. Exclusion of Dr. Otto’s Testimony to the Extent it Espouses and Relies on Inadmissible Hearsay

Patent Owner argues that testimony of Petitioner’s witness, Dr. Otto, should be excluded to the extent Dr. Otto relies on statements regarding the depth of field of the MAVIS II system discussed in Treuillet because Treuillet’s statements are hearsay and not the kinds of fact an expert would reasonably rely upon. Mot. to Excl. 1–13. Patent Owner further argues that Treuillet’s description of MAVIS II is inconsistent with Plassmann’s

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writings concerning MAVIS II and should be excluded for this reason as well. *Id.* at 13–14.

Patent Owner’s arguments for exclusion are unpersuasive for at least three reasons. First, as Petitioner argues in opposition to the motion to exclude, Treuillet is admissible as prior art. Opp. Mot. Excl. 2–3. Petitioner and Dr. Otto rely on Treuillet for what the Treuillet reference teaches to a person having ordinary skill in the art at the relevant time. Treuillet’s suggestions to a person having ordinary skill in the art remain relevant even if Treuillet were factually incorrect in some respects.

Second, even if considered hearsay, Dr. Otto properly relied on Treuillet. *Id.* at 4–7. Federal Rule of Evidence 703 provides that an expert may rely on facts and data that “need not be admissible.” Here, the evidence supports that Treuillet was published in an independent, respected, and peer-reviewed IEEE journal. *Id.* at 5–6 (citing evidence regarding reliability of the IEEE journal). Thus, Treuillet is the kind of evidence we would expect an expert witness or person having ordinary skill in the art to rely upon, and Dr. Otto was entirely reasonable on relying on Treuillet in forming his opinions.

Third, even if Treuillet were inconsistent with other evidence, such as Plassmann, this issue goes to the credibility of Dr. Otto’s testimony and the weight given to it in deciding ultimate issues of fact, rather than its admissibility.

For the reasons above, we deny Patent Owner’s motion to exclude with respect to Dr. Otto’s testimony.

B. Exhibits 1018, 1019, 1026, 1028, 1029, 1030, and 1033

Patent Owner seeks to exclude Exhibits 1018, 1019, 1026, 1028, 1029, 1030, and 1033 because “the Petition does not cite or otherwise rely

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on them.” Mot. to Excl. 15. Petitioner argues that it relied on exhibits 1026, 1029, 1030, 1033 and 1034, in the Petition and in cited paragraphs of Dr. Otto’s declaration. Opp. Mot. Excl. 12 (citing, e.g., Pet. 5, 38, 44, 46–47, 53–58, 60, 72, 75; Ex. 1003, Otto Decl. ¶¶ 161–163, 323, 390–391, 410, 413–414). Petitioner acknowledges that it did not rely on Exhibits 1018, 1019, and 1028, but argues that Patent Owner’s request is unnecessary and should be denied as moot. *Id.*

In rendering our decision, we only consider Petitioner’s evidence to the extent it is properly presented in the Petition or the Reply. We consider Petitioner’s evidence that Dr. Otto cites only to the extent explanation of the evidence is properly presented in the Petition or the Reply or only for purposes of assessing whether Dr. Otto’s testimony presented in the Petition or the Reply is well-grounded. As such, resolution of Patent Owner’s motion to exclude with respect to these exhibits would have no affect our decision making and is therefore moot.

VIII. PATENT OWNER’S OBJECTION TO DEMONSTRATIVES

Patent Owner objects to certain of Petitioner’s demonstratives for oral argument because, for example, the demonstratives constitute evidence that Petitioner did not reference or discuss in a prior paper, according to Patent Owner. *See, e.g.*, Paper 57 (“PO Objs.”) 2. Patent Owner also objects to certain demonstratives as mischaracterizing the record. *Id.* at 1.

Demonstratives for oral argument are not evidence, and we do not rely on demonstratives as evidence in our decision making. Paper 44, 3. Because demonstratives are not evidence and we do not rely on them in making our decision making, Patent Owner’s objections to the demonstratives likewise do not affect our decision making and are therefore moot.

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IX. CONCLUSION¹⁸

Having considered the arguments and evidence on record, we conclude the Petitioner has demonstrated by a preponderance of the evidence that all the challenged claims are unpatentable.

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–5, 9–12, 15, 16, 20	103	Plassmann, Treuilett, Staller	1–5, 9–12, 15, 16, 20	
21–23	103	Plassmann, Treuilett, Staller, Peng	21–23	
Overall Outcome			1–5, 9–12, 15, 16, 20–23	

X. ORDER

In consideration of the above it is:

ORDERED that claims 1–5, 9–12, 15, 16, and 20–23 are unpatentable;

FURTHER ORDERED that Patent Owner's Motion to Exclude is denied with respect to evidence addressed by Section VII.A, *supra*, and is

¹⁸ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. §§ 42.8(a)(3), (b)(2).

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dismissed as moot with respect to evidence addressed by Section VII.B,
supra;

FURTHER ORDERED that Patent Owner's Objections to Petitioner's
Demonstratives are overruled; and

FURTHER ORDERED that that, because this is a Final Written
Decision, parties to the proceeding seeking judicial review of the decision
must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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Patent 10,681,334 B2

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**UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD**

CANFIELD SCIENTIFIC, INC.,
Petitioner

v.

QUANTIFICARE S.A.,
Patent Owner

CASE NO. IPR 2021-01511

PATENT NO. 10,070,119

PATENT OWNER'S NOTICE OF APPEAL

Pursuant to 35 U.S.C. §§ 141, 142 and 319, and 37 C.F.R. §§ 90.2 and 90.3, Patent Owner QuantifiCare S.A. hereby provides notice that it appeals to the United States Court of Appeals for the Federal Circuit from the Final Written Decision of the Patent Trial and Appeal Board (“the Board”) dated March 9, 2023 (Paper 61) and from all underlying orders, decisions, rulings, and opinions regarding U.S. Patent No. 10,070,119 B2 in Inter Partes Review No. IPR2021-01511. This Notice is timely under 37 C.F.R. § 90.3, having been filed within 63 days after the date of the Final Written Decision. A copy of the Final Written Decision is attached as Exhibit A.

Pursuant to 37 C.F.R. § 90.2(a)(3)(ii), Patent Owner anticipates that the issues on appeal may include but are not limited to: the Board’s determination that claims 1–4 and 8-11 are unpatentable under 35 U.S.C. § 103(a); the Board’s claim constructions; the Board’s failure to consider material evidence presented in the proceeding; the Board’s consideration of new arguments and evidence presented by Petitioner for the first time in its reply; the Board’s failure to adequately explain the rationales for the foregoing; and any other of the Board’s findings or determinations supporting or relating to these issues, as well as all other issues the Board decided adversely to Patent Owner in any order, decision, ruling, or opinion.

Pursuant to 35 U.S.C. § 142, 37 C.F.R. § 90.2(a), and Fed. Cir. R. 15(a)(1), this Notice is being filed with the Patent Trial and Appeal Board, the Clerk’s Office

of the United States Court of Appeals for the Federal Circuit via CM/ECF, and the
Director of the United States Patent and Trademark Office.

Date: May 9, 2023

Respectfully Submitted

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CERTIFICATE OF FILING AND SERVICE

Pursuant to 37 C.F.R. § 42.6(e), Fed. R. App. P. 25 and Fed. Cir. R. 25, the undersigned hereby certifies that on May 9, 2023, a true and correct copy of the foregoing PATENT OWNER'S NOTICE OF APPEAL has been caused to be filed with the Patent Trial and Appeal Board through the Board's electronic filing system, filed with the Director of the United States Patent and Trademark Office by USPS Express Mail service (Label No. EK 844420670 US) to the following address:

Director of the United States Patent and Trademark Office
c/o Office of the General Counsel
P.O. Box 1450
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filed with the Clerk's Office of the United States Court of Appeals for the Federal Circuit via CM/ECF, along with the required filing/docketing fees; and served via electronic and first class mail on counsel of record for Petitioner as set forth below:

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**UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD**

CANFIELD SCIENTIFIC, INC.,
Petitioner

v.

QUANTIFICARE S.A.,
Patent Owner

CASE NO. IPR 2021-01518

PATENT NO. 10,165,253

PATENT OWNER'S NOTICE OF APPEAL

RECEIVED
2023 MAR 11 PM 1:16
UNITED STATES PATENT AND TRADEMARK OFFICE

Pursuant to 35 U.S.C. §§ 141, 142 and 319, and 37 C.F.R. §§ 90.2 and 90.3, Patent Owner QuantifiCare S.A. hereby provides notice that it appeals to the United States Court of Appeals for the Federal Circuit from the Final Written Decision of the Patent Trial and Appeal Board (“the Board”) dated March 9, 2023 (Paper 61) and from all underlying orders, decisions, rulings, and opinions regarding U.S. Patent No. 10,165,253 B2 in Inter Partes Review No. IPR2021-01518. This Notice is timely under 37 C.F.R. § 90.3, having been filed within 63 days after the date of the Final Written Decision. A copy of the Final Written Decision is attached as Exhibit A.

Pursuant to 37 C.F.R. § 90.2(a)(3)(ii), Patent Owner anticipates that the issues on appeal may include but are not limited to: the Board’s determination that claims 1–4, 8-12, 15, 16 and 20-23 are unpatentable under 35 U.S.C. § 103(a); the Board’s claim constructions; the Board’s failure to consider material evidence presented in the proceeding; the Board’s consideration of new arguments and evidence presented by Petitioner for the first time in its reply; the Board’s failure to adequately explain the rationales for the foregoing; and any other of the Board’s findings or determinations supporting or relating to these issues, as well as all other issues the Board decided adversely to Patent Owner in any order, decision, ruling, or opinion.

Pursuant to 35 U.S.C. § 142, 37 C.F.R. § 90.2(a), and Fed. Cir. R. 15(a)(1), this Notice is being filed with the Patent Trial and Appeal Board, the Clerk’s Office

of the United States Court of Appeals for the Federal Circuit via CM/ECF, and the
Director of the United States Patent and Trademark Office.

Date: May 9, 2023

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CERTIFICATE OF FILING AND SERVICE

Pursuant to 37 C.F.R. § 42.6(e), Fed. R. App. P. 25 and Fed. Cir. R. 25, the undersigned hereby certifies that on May 9, 2023, a true and correct copy of the foregoing PATENT OWNER'S NOTICE OF APPEAL has been caused to be filed with the Patent Trial and Appeal Board through the Board's electronic filing system, filed with the Director of the United States Patent and Trademark Office by USPS Express Mail service (Label No. EK 844420670 US) to the following address:

Director of the United States Patent and Trademark Office
c/o Office of the General Counsel
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filed with the Clerk's Office of the United States Court of Appeals for the Federal Circuit via CM/ECF, along with the required filing/docketing fees; and served via electronic and first class mail on counsel of record for Petitioner as set forth below:

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QuantifiCare S.A.

**UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD**

CANFIELD SCIENTIFIC, INC.,
Petitioner

v.

QUANTIFICARE S.A.,
Patent Owner

CASE NO. IPR 2021-01519

PATENT NO. 10,681,334

PATENT OWNER'S NOTICE OF APPEAL

Pursuant to 35 U.S.C. §§ 141, 142 and 319, and 37 C.F.R. §§ 90.2 and 90.3, Patent Owner QuantifiCare S.A. hereby provides notice that it appeals to the United States Court of Appeals for the Federal Circuit from the Final Written Decision of the Patent Trial and Appeal Board (“the Board”) dated March 17, 2023 (Paper 60) and from all underlying orders, decisions, rulings, and opinions regarding U.S. Patent No. 10,681,334 B2 in Inter Partes Review No. IPR2021-01519. This Notice is timely under 37 C.F.R. § 90.3, having been filed within 63 days after the date of the Final Written Decision. A copy of the Final Written Decision is attached as Exhibit A.

Pursuant to 37 C.F.R. § 90.2(a)(3)(ii), Patent Owner anticipates that the issues on appeal may include but are not limited to: the Board’s determination that claims 1–5, 12, 15, 16 and 20-23 are unpatentable under 35 U.S.C. § 103(a); the Board’s claim constructions; the Board’s failure to consider material evidence presented in the proceeding; the Board’s consideration of new arguments and evidence presented by Petitioner for the first time in its reply; the Board’s failure to adequately explain the rationales for the foregoing; and any other of the Board’s findings or determinations supporting or relating to these issues, as well as all other issues the Board decided adversely to Patent Owner in any order, decision, ruling, or opinion.

Pursuant to 35 U.S.C. § 142, 37 C.F.R. § 90.2(a), and Fed. Cir. R. 15(a)(1), this Notice is being filed with the Patent Trial and Appeal Board, the Clerk’s Office

of the United States Court of Appeals for the Federal Circuit via CM/ECF, and the Director of the United States Patent and Trademark Office.

Date: May 12, 2023

Respectfully Submitted

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CERTIFICATE OF FILING AND SERVICE

Pursuant to 37 C.F.R. § 42.6(e), Fed. R. App. P. 25 and Fed. Cir. R. 25, the undersigned hereby certifies that on May 12, 2023, a true and correct copy of the foregoing PATENT OWNER'S NOTICE OF APPEAL has been caused to be filed with the Patent Trial and Appeal Board through the Board's electronic filing system, filed with the Director of the United States Patent and Trademark Office by USPS Express Mail service (Label No. EK 844420683 US) to the following address:

Director of the United States Patent and Trademark Office
c/o Office of the General Counsel
P.O. Box 1450
Alexandria, VA 22313-1450

filed with the Clerk's Office of the United States Court of Appeals for the Federal Circuit via CM/ECF, along with the required filing/docketing fees; and served via electronic and first class mail on counsel of record for Petitioner as set forth below:

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Date: May 12, 2023

Respectfully Submitted

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UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

QUANTIFICARE S.A.,
Patent Owner/Appellant

v.

Appeal Nos. 2023-1917¹
2023-1918
2023-1919

CANFIELD SCIENTIFIC, INC.,
Petitioner/Appellee

Proceeding Nos.: IPR2021-01511, IPR2021-01518 and IPR2021-01519

NOTICE FORWARDING CERTIFIED LIST

A Notice of Appeal to the United States Court of Appeals for the Federal Circuit was timely filed May 9, 2023 and May 12, 2023, respectively, in the United States Patent and Trademark Office in connection with the above identified *Inter Partes Review* proceedings. Pursuant to 35 U.S.C. § 143, a Certified List is this day being forwarded to the Federal Circuit.

Respectfully submitted,

Date: June 28, 2023

By: Macia L. Fletcher
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Under Secretary of Commerce for Intellectual Property and
Director of the United States Patent and Trademark Office

¹ Appeal No. 2023-1917 (Lead) is consolidated with Appeal Nos. 2023-1918 and 2023-1919 (Member Cases) pursuant to Court Order (Dkt. No. 11) and Note to File (Dkt. No. 12) dated June 6, 2023.

Case: 23-1918 Document: 13 Page: 2 Filed: 06/29/2023

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy of the foregoing NOTICE FORWARDING CERTIFIED LIST has been served, via electronic mail, on counsel for Appellant and Appellee this 28th day of June, 2023, as follows:

<u>PATENT OWNER:</u> Mark D. Giarratana Kevin Reiner MCCARTER & ENGLISH, LLP mggiarratana@mccarter.com kreiner@mccarter.com	<u>PETITIONER:</u> Thomas Lee Duston Chelsea Murray Isha S. Shah Michael R. Weiner MARSHALL, GERSTEIN & BORUN LLP tduston@marshallip.com cmurray@marshallip.com ishah@marshallip.com mweiner@marshallip.com
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U.S. DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

June 28, 2023

(Date)

THIS IS TO CERTIFY that the attached document is a list of the papers that comprise the record before the Patent Trial and Appeal Board (PTAB) for the *Inter Partes Review* proceeding identified below.

CANFIELD SCIENTIFIC, INC.,
Petitioner,

v.

QUANTIFICARE S.A.,
Patent Owner.

Case: IPR2021-01511
Patent No. 10,070,119 B2
By authority of the

DIRECTOR OF THE UNITED STATES
PATENT AND TRADEMARK OFFICE

Macia L. Fletcher

Certifying Officer



Prosecution History ~ IPR2021-01511

Date	Document
9/7/2021	Petition for Inter Partes Review
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9/15/2021	Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner's Preliminary Response
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12/16/2021	Patent Owner's Notice Regarding Serving and Filing of Preliminary Patent Owner's Response and Exhibits Thereto
12/16/2021	Patent Owner's Preliminary Response
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Case: 23-1918 Document: 13 Page: 5 Filed: 06/29/2023

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**U.S. DEPARTMENT OF COMMERCE
United States Patent and Trademark Office**

June 28, 2023

(Date)

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**CANFIELD SCIENTIFIC, INC.,
Petitioner,**

v.

**QUANTIFICARE S.A.,
Patent Owner.**

**Case: IPR2021-01518
Patent No. 10,165,253 B2**
By authority of the

**DIRECTOR OF THE UNITED STATES
PATENT AND TRADEMARK OFFICE**

Macia L. Fletcher

Certifying Officer



Prosecution History ~ IPR2021-01518

Date	Document
9/8/2021	Petition for Inter Partes Review
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9/15/2021	Notice of Filing Date Accorded to Petition and Time for Filing Patent Owner's Preliminary Review
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Case: 23-1918 Document: 13 Page: 8 Filed: 06/29/2023

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June 28, 2023

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QUANTIFICARE S.A.,
Patent Owner.

Case: IPR2021-01519
Patent No. 10,681,334 B2
By authority of the

DIRECTOR OF THE UNITED STATES
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Macia L. Fletcher

Certifying Officer



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Case: 23-1918 Document: 13 Page: 11 Filed: 06/29/2023

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CANFIELD SCIENTIFIC, INC.,
Petitioner,

v.

QUANTIFICARE S.A.,
Patent Owner.

IPR2021-01511
Patent 10,070,119 B2

Before BRIAN J. MCNAMARA, JOHN D. HAMANN, and
BRIAN D. RANGE, *Administrative Patent Judges*.

RANGE, *Administrative Patent Judge*.

JUDGMENT

Final Written Decision

Determining All Challenged Claims Unpatentable

Denying In Part and Dismissing In Part Patent Owner's Motion to Exclude

35 U.S.C. § 318(a)

I. INTRODUCTION

This is a Final Written Decision addressing the *inter partes* review challenging claims 1–4 and 8–11 of U.S. Patent No. 10,070,119 B2 (“the ’119 patent,” Ex. 1001). We have jurisdiction under 35 U.S.C. § 6. The evidentiary standard is a preponderance of the evidence. *See* 35 U.S.C. § 316(e) (2018); 37 C.F.R. § 42.1(d) (2019). We issue this Final Written Decision pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73 (20222). For the reasons that follow, we determine that Canfield Scientific, Inc. (“Petitioner”) demonstrates, by a preponderance of the evidence, that the challenged claims are unpatentable.

II. BACKGROUND

A. *Procedural History*

Petitioner filed a Petition (Paper 1, “Pet.”) requesting *inter partes* review of claims 1–4 and 8–11 of the ’119 patent. After institution, QuantifiCare S.A. (“Patent Owner”) filed a Patent Owner Response. *See* Paper 21 (“PO Resp.”). Petitioner filed a Reply (Paper 30, “Reply”), and Patent Owner filed a Sur-Reply (Paper 42, “PO Sur-reply”). Additionally, Patent Owner filed a motion to exclude evidence (Paper 46, “Mot. Excl.”), Petitioner responded (Paper 47, “Opp. Mot. Excl.”), and Patent Owner provided a reply brief (Paper 53, “Mot. Excl. Reply”).

We heard oral argument for this *inter partes* review (as well as for two related *inter partes* reviews, IPR2021-01518 and IPR2021-01519) on December 14, 2022, and a transcript of the hearing is part of the record of this proceeding. Paper 60 (“Tr.”).

B. *Related Matters*

The parties identify the following as a related matter: *QuantifiCare, Inc. v. Canfield Scientific, Inc.*, C.A. No. 1:20-cv-12305 (D.N.J.). Pet. 3;

IPR2021-01511
Patent 10,070,119 B2

Paper 4, 1. In addition, Petitioner has filed a petition for *inter partes* review of two additional patents related to the '119 patent that are also owned by Patent Owner: (i) U.S. Patent No. 10,165,253 B2 (IPR2021-01518) and (ii) U.S. Patent No. 10,681,334 B2 (IPR2021-01519).

C. The '119 Patent (Ex. 1001)

The '119 patent is titled “Device and Method to Reconstruct Face and Body in 3D.” Ex. 1001, code 54. The challenged patent relates to a stereophotogrammetry device used “to picture and reconstruct in 3D the surface of objects of different sizes,” e.g., different body parts such as the face and the torso. *Id.* at 3:22–25; *see id.* at 1:6–14, 1:41–48. By way of background, the '119 patent explains that “[s]tereophotogrammetry consists in [simultaneously] gathering the images of a subject from at least two views with a calibrated camera,” i.e., a “stereo-pair.” *Id.* at 1:24–29. The stereo-pair is used to “reconstruct . . . a dense representation in 3-Dimensions of the surface of the observed object.” *Id.* at 1:30–32.

Figures 1 and 2, reproduced below, respectively show side- and top-views of an “implementation” of a stereophotogrammetry device and its components. *Id.*

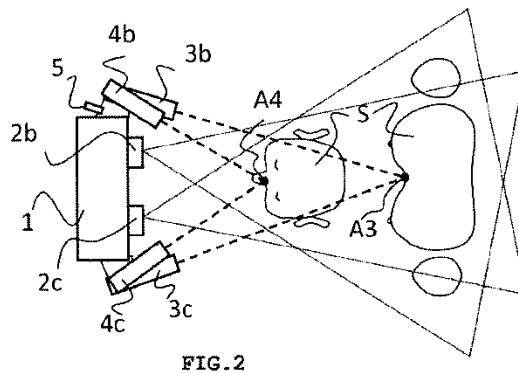
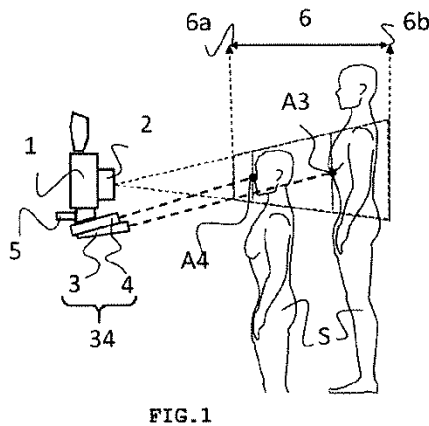


Figure 1 represents a possible implementation of the '119 patent's device as viewed from the side, and Figure 2 represents a possible implementation of the device as viewed from the top. *Id.* at 3:48–51. As shown in Figures 1 and 2, camera body (1) includes double optics (2). *Id.* at 8:23–24. As shown in Figure 2, double optics (2) are “composed of two sub-optics (2*b*) and (2*c*), enabling the acquisition of a stereo[-]pair [of images] corresponding to two slightly different viewing angles” simultaneously. *Id.* at 8:24–27; *see id.* at 3:28–31. For example, Figure 8, shown below, shows a series of stereo-pair images taken at different angles for a face. *Id.* at 11:1–8.

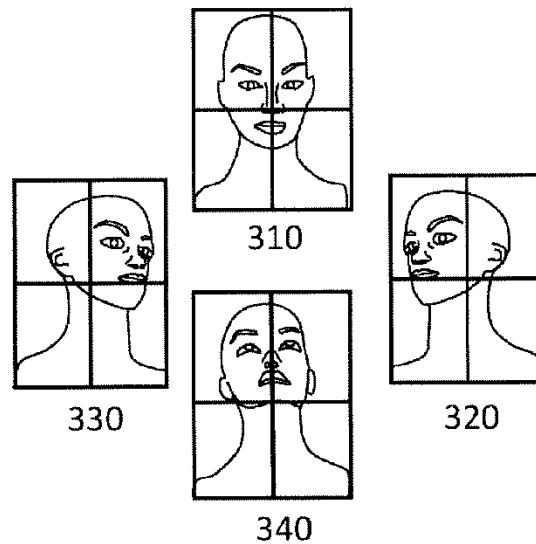


FIG. 8

The '119 patent specification describes Figure 8 as presenting “viewpoints optimized for imaging a face using a field of view close to an A4 surface format.” *Id.* at 3:66–67. Using the captured stereo-pairs, “a comprehensive representation in 3D of the surface of the subject (S)” can be constructed. *Id.* at 10:26–37.

Further, the stereophotogrammetry device captures stereo-pairs of images at “two distinct distances for picture taking corresponding respectively to position (A3) and (A4)” such that the stereo-pairs of images are in focus at positions A3 and A4, which are within the device’s depth of field 6. *Id.* at 8:29–39; *see id.* at 6:23–26. For example, position A3 is used for capturing images of the torso while position A4 is used for capturing images of the face. *Id.* at 6:3–12; *see id.* at 1:41–48. Positions A3 and A4 can be identified by the convergence of respective light patterns projected onto the subject to be imaged, the respective light patterns converging at the distances for positions A3 and A4. *Id.* at 4:46–67. For example, as shown in Figure 2, a light pattern emitted by first pair of light beamers (3b) and (3c) converge at point (A3) and a different light pattern emitted by second pair of light beamers (4b) and (4c) converge at point (A4). *Id.* at 8:40–44; *see id.* at 4:56–59. Accordingly, “by placing the subject so that the light patterns projected by a first pair of beamers are superposed on the surface of the subject[,] one is placing the subject at” the first pre-defined position (and similarly for the light pattern emitted by the second pair of beamers converging at the second position). *Id.* at 4:48–56; 5:10–26.

D. Challenged Claims

Petitioner challenges claims 1–4 and 8–11 of the ’119 patent. Pet. 1. Claim 1 is the only challenged independent claim. Claim 1 is illustrative of the claimed subject matter, and we reproduce claim 1 with Petitioner’s added bracketed identifiers and line breaks for claim elements.

1. [1.01] A device for stereophotogrammetry comprising
[1.02] a camera body (1) and

[1.03] a double-optics (2) comprising two sub-optics (2*b*) and (2*c*), configured for a simultaneous acquisition of two views according to two different angles,

[1.04] wherein the device is comprising a positioning system (34) configured to define a position of a target subject (S) for one of at least two distinct pre-defined point positions (A3, A4) of the target subject (S) relative to the stereophotogrammetry device,

[1.05] the at least two distinct predefined point positions comprising a closer point position (A4) and a farther point position (A3), the closer point position (A4) being closer to the stereophotogrammetry device than the farther point position (A3), and wherein the positioning system (34) is comprising at least two pairs of light beamers (3*b*, 3*c*) and (4*b*, 4*c*) where a first pair of light beamers (3*b*, 3*c*) is converging to the farther point position (A3) and a second pair of light beamers (4*b*, 4*c*) is converging to the closer point position (A4), and

[1.06] wherein the device comprises a switch (5) comprising a first selection position configured to select the farther point position (A3) and a second selection position configured to select the closer point position (A4),

[1.07] wherein the switch (5) is configured to switch on the first pair of light beamers (3*b*, 3*c*) in the first selection position and wherein the switch (5) is configured to switch on the second pair of light beamers (4*b*, 4*c*) in the second selection position.

Ex. 1001, 11:32–57; *see also* Pet. 16 (using same identifiers).

E. Asserted Grounds of Unpatentability

We instituted trial based on the following grounds of unpatentability, which are all the grounds of unpatentability raised in the Petition:

Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1	1–4, 8	103	Plassmann ¹ , Treuillet ² ,

¹ WO 2010/097572 A2, published Sept. 2, 2010 (Ex. 1007).

² Sylvie Treuillet et al., *Three-Dimensional Assessment of Skin Wounds Using a Standard Digital Camera*, IEEE Transactions on Medical Imaging, Vol. 28, No. 5 at 752 (2009) (Ex. 1016).

Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
			Staller ³
2	9–11	103	Plassmann, Treuillet, Staller, Peng ⁴

Pet. 5. The Petition and Reply are supported, for example, by declarations of Dr. Gerhardt Paul Otto, Ph.D. Exs. 1003, 1053. The Response and Sur-Reply are supported, for example, by declarations of Dr. Daniel van der Weide. Exs. 2006, 2013.

III. PATENT OWNER’S MOTION TO EXCLUDE

Patent Owner’s Motion to Exclude seeks to exclude two areas of evidence. We address each in turn.

A. *Exclusion of Dr. Otto’s Testimony to the Extent it Espouses and Relies on Inadmissible Hearsay*

Patent Owner argues that testimony of Petitioner’s witness, Dr. Otto, should be excluded to the extent Dr. Otto relies on statements regarding the depth of field of the MAVIS II system discussed in Treuillet because Treuillet’s statements are hearsay and not the kinds of fact an expert would reasonably rely upon. Mot. Excl. 1–12. Patent Owner further argues that Treuillet’s description of MAVIS II is inconsistent with Plassmann’s writings concerning MAVIS and should be excluded for this reason as well. *Id.* at 13–14.

Patent Owner’s argument for exclusion is unpersuasive for three reasons. First, as Petitioner argues in opposition to the motion to exclude, Treuillet is admissible as prior art. Opp. Mot. Excl. 2–3. Petitioner and Dr.

³ US 7,257,322 B2, issued Aug. 14, 2007 (Ex. 1006).

⁴ Qi Peng et al., *Automated 3D Scenes Reconstruction Using Multiple Stereo Pairs from Portable Four-Camera Photographic Measurement System*, International Journal of Optics, Vol. 2015 (2015).

Otto rely on Treuillet for what the Treuillet reference teaches to a person having ordinary skill in the art at the relevant time. Treuillet's suggestions to a person having ordinary skill in the art remain relevant even if Treuillet were factually incorrect in some respects.

Second, even if considered hearsay, Dr. Otto properly relied on Treuillet. Opp. Mot. Excl. 4–7. Under Federal Rule of Evidence 703, an expert may rely on facts and data that “need not be admissible,” including hearsay (double or otherwise). Here, the evidence supports that Treuillet was published in an independent, respected, and peer-reviewed IEEE journal. *Id.* at 5–6 (citing evidence regarding reliability of the IEEE journal). In addition, we find unavailing Patent Owner's arguments concerning “Reference 45.”⁵ Mot. Excl. 3–5; Reply Mot. Excl. 1–5. Rather, we find that it is appropriate for an expert also to rely on the sourcing in article published in such an IEEE journal. Thus, Treuillet is the kind of evidence we would expect an expert witness or person having ordinary skill in the art to rely upon, and Dr. Otto was entirely reasonable on relying on Treuillet in forming his opinions

Third, even if Treuillet were inconsistent with other evidence, such as Plassmann, this issue would go to the credibility of Dr. Otto's testimony and the weight given to it in deciding ultimate issues of fact rather than admissibility in the first instance.

For the reasons above, we deny Patent Owner's motion to exclude with respect to Dr. Otto's testimony.

⁵ Treuillet cited this reference as follows: “MAVIS II: 3-D wound instrument measurement Univ. Glamorgan, 2006 [Online]. Available: <http://www.imaging.research.glam.ac.uk/projects/wm/mavis/>.” Ex. 1016, 762.

B. *Exhibits 1018, 1019, 1026, 1028–1030, 1033, and 1034*

Patent Owner seeks to exclude Exhibits 1018, 1019, 1026, 1028–1030, 1033, and 1034 because “the Petition does not cite or otherwise rely on them.” Mot. Excl. 14–15. Petitioner argues that it relied on all of these exhibits aside from Exhibits 1018 and 1019.

In rendering our decision, we only consider Petitioner’s evidence to the extent it is properly presented in the Petition or the Reply. We consider Petitioner’s evidence that Dr. Otto cites only to the extent explanation of the evidence is properly presented in the Petition or the Reply or only for purposes of assessing whether Dr. Otto’s testimony presented in the Petition or the Reply is well-grounded. As such, resolution of Patent Owner’s motion to exclude with respect to these exhibits would not affect our decision making and is therefore moot.

For the reasons above, we dismiss as moot Patent Owner’s motion to exclude these exhibits.

IV. PATENT OWNER’S OBJECTIONS TO PETITIONER’S
DEMONSTRATIVES

Patent Owner objects to a number of Petitioner’s demonstratives for oral argument because, for example, the demonstratives constitute evidence that Petitioner did not reference or discuss in a prior paper. *See, e.g.*, Paper 58, 2. Patent Owner also objects to certain demonstratives as mischaracterizing the record. *Id.* at 1.

Demonstratives for oral argument are not evidence, and we do not rely on demonstratives as evidence in our decision making. Paper 45, 2 (Order Setting Oral Argument). Because demonstratives do not affect our decision making, Patent Owner’s objections to the demonstratives likewise do not affect our decision making and are therefore moot.

V. ANALYSIS

A. *Level of Ordinary Skill in the Art*

To determine whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). In assessing the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citing *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962–63 (Fed. Cir. 1986)). “[O]ne or more factors may predominate.” *Id.*

Petitioner argues that

[a] person of ordinary skill in the art (“POSITA”) would have had a working understanding of photography, stereophotogrammetry, and distance measuring in photography or stereophotogrammetry. Such an individual would have a master’s degree with a scientific focus on subjects such as optics and/or image processing, with at least about three years of experience in the field of photography, and stereophotogrammetry, as well as image processing in these fields, or an equivalent qualification.

Pet. 15 (citing Ex. 1003 ¶¶ 17–20).

Patent Owner argues that a person having ordinary skill in the art “would have a Bachelor’s degree in Physics or Electrical engineering or a similar field and two to three years of experience, including in image processing and computer graphics” and that Petitioner’s “assertion of a higher level . . . is incorrect.” PO Resp. 23.

The parties do not substantively address the differences in their proposed definitions for one of ordinary skill in the art. Pet. 15; PO Resp. 23; *see generally* Reply; PO Sur-reply. Moreover, the parties agree that which definition we adopt does not substantively impact our analysis of the parties' arguments concerning unpatentability. Tr. 29:19–30:9, 75:20–25.

Because Patent Owner's definition of the level of skill in the art is consistent with the '253 patent and the asserted prior art, we adopt it for purposes of this Final Written Decision. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *GPAC*, 57 F.3d at 1579; *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978). In addition, we do not find support in the record for requiring one of ordinary skill in the art to have had a master's degree. Pet. 15; Ex. 2013 ¶ 31 (testifying why a master's degree was unnecessary). Our analysis herein, however, does not turn on which of the parties' definitions we adopt.

B. Claim Construction

Because the Petition was filed after November 13, 2018, we apply the same claim construction standard that would be used in a civil action under 35 U.S.C. § 282(b), following the standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b) (2021). In applying such standard, claim terms are generally given their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art, at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. "In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence." *DePuy Spine, Inc. v.*

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Medtronic Sofamor Danek, Inc., 469 F.3d 1005, 1014 (Fed. Cir. 2006)
(citing *Phillips*, 415 F.3d at 1312–17).

Petitioner submits “that [no] express constructions are required for any terms.” Pet. 17. Patent Owner argues that the claim terms should have their plain and ordinary meaning. PO Sur-reply 1. The parties dispute, however, the scope of the plain and ordinary meaning of “two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views according to two different angles.” Thus, we address the parties’ dispute. *See Eon Corp. IP Holdings v. Silver Spring Networks*, 815 F.3d 1314, 1318 (Fed. Cir. 2016) (finding that disputes between the parties over the plain and ordinary meaning of a term need to be resolved as a matter of claim construction).

The gravamen of the parties’ dispute is what “different angles” refers to in the context of this limitation. According to Patent Owner, “different angles” refers to the orientation of the optical axis of each sub-optic. *E.g.*, PO Resp. 5–7. Specifically, Patent Owner argues that the limitation excludes configurations where the sub-optics’ optical axes are spaced in parallel, such as in a conventional stereophotogrammetry device, because the two views would be acquired at the same angle. *E.g., id.* In contrast, Petitioner argues that “different angles” refers to the sub-optics viewing a *subject* from different angles, such as when the sub-optics are spaced apart—parallel configurations are not excluded. *E.g.*, Pet. Reply 1.

We address in detail the parties’ arguments below, starting with the intrinsic evidence.

1. *Claim Language*

Patent Owner argues that “[t]he claim language does not mention light ‘from the subject’ or ‘object to be imaged,’ much less angles at which light

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is received from different points on a subject/object.” PO Resp. 19 (citing Ex. 2013 ¶ 101). “Rather, the ‘two different angles’ limitation defines an intrinsic characteristic of the sub-optics, *i.e.*, how they are ‘configured’” or angled, according to Patent Owner. *Id.* (citing Ex. 2013 ¶ 100).

We find this argument unavailing. Rather, we agree with Petitioner and determine that the claim language does not mean that the sub-optics are angled but instead means that they each view a subject from different angles. Ex. 1020, 11:43–45; Pet. Reply 7. Specifically, this limitation recites that the two sub-optics are “configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1020, 11:43–45. Notably, “according to two different angles” directly follows “two views,” rather than directly following “configured.” *Id.* And “view” means “[a] scene or an arrangement of subject material for a photograph,” according to a technical dictionary provided by Patent Owner. Ex. 2014,⁶ 210 (defining “view”). In other words, the term “view” itself refers to viewed subject material—a target subject.

We also find unavailing Patent Owner’s argument that “the ‘subject’ is claimed only in connection with the ‘positioning system (34)’ ‘configured to define . . . pre-defined point positions (A3, A4) of the target subject (S).” PO Resp. 19 (citing Ex. 1001, 11:36–40; Ex. 2013 ¶ 102). Again, the term “view” implicates the subject. Ex. 2014, 210.

We also find unavailing Patent Owner’s argument that the claims “disclose configuring the sub-optics according to ‘two different angles’ as a prerequisite to ‘pre-defining’ the ‘positions (A3, A4) of the target subject

⁶ Leslie Stroebe & Hollis N. Todd, *Dictionary of Contemporary Photography* (1974).

(S),’ as further claimed, and locating the subject at such positions within the two views.” PO Resp. 19–20 (citing Ex. 2013 ¶ 103); *see also id.* at 20 (arguing that dependent claims also support this argument). This argument is inapposite, and does not exclude parallel sub-optics. Rather, as Patent Owner acknowledges, conventional stereophotogrammetry devices can include parallel sub-optics “configured (spaced) to acquire two views,” and provide a stereoscopic binocular area where “the parallel views intersect to form stereo-pairs that can be reconstructed into three-dimensional representations.” PO Resp. 5–6; Ex. 2013 ¶ 67; Ex. 2015,⁷ 90. Hence, positions (A3, A4) can be predefined distances for the target subject S within that stereoscopic binocular area.

We likewise find unavailing Patent Owner’s argument that “the ‘two different angles’ limitation has nothing to do with the angles at which the sub-optics receive light from a subject but rather defines the space within which the subject must be located to be imaged in the first place.” *Id.* at 20 (citing Ex. 2013 ¶ 100); PO Sur-reply 2. This argument also is inapposite, and does not indicate that the claimed sub-optics’ axes are not in parallel, as Patent Owner argues. Rather, the space within which the subject must be located can be the stereoscopic binocular area. Ex. 2015, 90; PO Resp. 4.

We also find unavailing Patent Owner’s argument that because “[d]isplaced sub-optics may be configured to acquire two views at the same angle, or at ‘two different angles,’” “construing ‘two different angles’ to mean any displaced sub-optics would read the ‘two different angles’ limitation out of the claims.” PO Resp. 22 (citing Ex. 2013 ¶ 107); PO Sur-reply 5 (making same argument). Rather, we conclude that “according

⁷ Richard W. Kroon, *3D A-to-Z, An Encyclopedic Dictionary* (2012).

to two different angles,” in the context of the limitation, is needed to claim a stereophotogrammetry device. Put differently, we agree with Petitioner and conclude that claim 1 does not otherwise recite that the two sub-optics are spaced, such as in a conventional stereophotogrammetry device. Ex. 1001, 11:32–57; Pet. Reply 7 (citing Ex. 1053 ¶ 31).

Although the preamble for claim 1 recites “[a] device for stereophotogrammetry,” “[g]enerally, the preamble does not limit the claims.” Ex. 1001, 11:32–57; *Georgetown Rail Equip. Co. v. Holland L.P.*, 867 F.3d 1229, 1236 (Fed. Cir. 2017) (citation omitted). We also are persuaded by Petitioner’s argument that “the preamble here is not limiting, because the body of the claim provides a complete description of the device.” Pet. Reply 7 (citing *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997)). Hence, “two different angles” is not read out of the claim, but rather serves to claim a stereophotogrammetry device (e.g., by requiring spacing of the sub-optics).

Regardless, as Petitioner notes, no “canon of claim construction is absolute in its application and [] some surplusage may exist in some claims.” Pet. Reply 7 (quoting *Decisioning.com, Inc. v. Federated Dep’t Stores, Inc.*, 527 F.3d 1300, 1312 (Fed. Cir. 2008) (acknowledging that proper construction of “‘remote interface’ arguably renders the term ‘public’ in [a dependent claim] surplusage”)). And we view the phrase “configured for a simultaneous acquisition of two views according to two different angles” as referring to a stereophotogrammetry device, regardless if every word is needed to convey it.

In addition, we find unavailing Patent Owner’s argument that Petitioner makes new arguments concerning viewing the subject from different angles and the preamble not being limiting. PO Sur-reply 1 & n.1.

Simply put, these arguments from Petitioner involve issues related to claim construction regarding the scope of the plain and ordinary meaning of this limitation and which were raised by Patent Owner in its Response. Petitioner argument is, thus, allowable. *See Consolidated Trial Practice Guide* (November 2019)⁸ (“CTPG”), 45 (“The petitioner may respond to any such new claim construction issues raised by the patent owner.”).

2. *The '119 Patent Specification*

The parties each argue that the '119 patent Specification supports their arguments for the plain and ordinary meaning of this claim limitation. More specifically, Patent Owner argues that Figures 2–5 support that the sub-optics are oriented to have non-parallel (i.e., inwardly angled) optical axes. *See, e.g.*, PO Resp. 6. Patent Owner illustrates this position by annotating Figure 2 of the '119 patent. PO Resp. 17. We reproduce Patent Owner's annotated figure below.

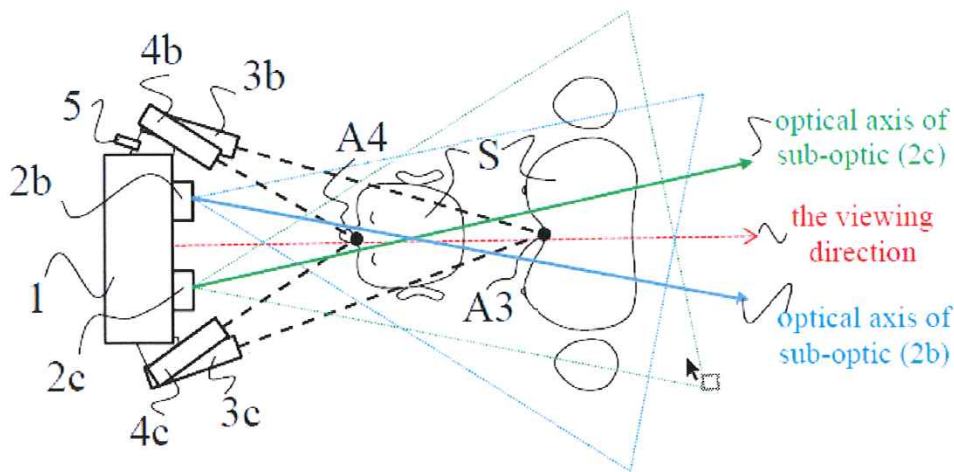


Figure 2 “represent[s] a possible implementation of the device viewed from the top.” Ex. 1001, 3:50–51. Patent Owner annotates Figure 2 by coloring

⁸ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

the pyramid extending from sub-optic 2b blue and coloring the pyramid extending from sub-optic 2c green. PO Resp. 17. Patent Owner also adds a solid blue arrow and a solid green arrow from each sub-optic to perpendicularly bisect the base of each pyramid, respectively. *Id.* Patent Owner labels each of these arrows as the “optical axis” of the respective sub-optic. *Id.* Patent Owner also adds a dotted arrow from the midpoint between the sub-optics through the centerpoint of an illustrated face and torso, and labels the arrow “the viewing direction.” *Id.*

We agree with Patent Owner that Figures 2–5 illustrate pyramid-shaped views acquired by the sub-optics where the pyramids are inwardly angled (rather than being perpendicular to the device’s plane). Ex. 1001, Figs. 2–5. But the Specification indicates that all of these figures illustrate *possible* or *exemplary* implementations. *See, e.g., id.* at 3:50–54 (stating that Figures 2 and 3 each illustrate a “possible implementation”); 9:26–30 (stating that Figure 4 is an “exemplary device”); 9:34–35 (stating that Figure 5 is an “exemplary device”). Thus, the Specification does not indicate that optical axes of the pyramids are essential to the invention; the Specification never even uses the term “optical axis.” To the contrary, the Specification provides that “[t]he double optics of the stereophotogrammetry device can be manufactured in different ways without impacting the functionality of the invention, provided that it is characterized by an increased depth of field.” *Id.* at 4:25–28.

Moreover, the Specification repeatedly refers to the different angles of the sub-optics relative to the viewed subject in a manner similar to the claims. *See, e.g.,* Ex. 1001, 4:7–14 (referring to “double optics enabling the acquisition of two simultaneous views with different angles *of the subject*”) (emphasis added), 4:20–31 (referring to “double optics” using “secondary

mirrors each receiving one image *of the subject* with a slightly different angle”) (emphasis added); Pet. Reply 3–5 (citing Ex. 1053 ¶¶ 19–29).

In addition, we find unavailing Patent Owner’s arguments concerning problems described in the Background section of the Specification and the advantages of the ’119 patent. PO Resp. 10–15. For example, the ’119 patent discloses that portable stereophotogrammetry devices previously developed included “a single, nominal distance for picture taking which is optimized either for the face or for breast, but not optimized for both applications at the same time,” according to Patent Owner. PO Resp. 9 (quoting Ex. 1001, 3:10–18; citing Ex. 2013 ¶ 73). Patent Owner argues that the ’119253 patent “ties the ‘two different angles’ limitation to overcoming the problem in the prior art and achieving the advantage of the invention” (i.e., a single stereophotogrammetry device for both distances). *Id.* at 10 (citing Ex. 1001, 3:28–31); *see also id.* (citing Ex. 1001, 4:25–29, 8:24–27; Ex. 2013 ¶ 76) (making same argument).

According to Patent Owner, however, if the sub-optics are configured for parallel views the field of view at point (A4) in Figure 2 “is too small to image the face and would not achieve the ‘advantage of the invention,’ *i.e.*, ‘a single portable stereophotogrammetry system . . . enabling the 3D reconstruction of the head . . . and . . . torso.’” *Id.* at 15 (quoting Ex. 1001, 8:8–15; citing Ex. 2013 ¶¶ 56, 87). This argument is unavailing. Rather, we agree with Petitioner and find that “[s]imply moving the subject further from the camera would place the face” within the view pyramids. *See* Pet. Reply 3–5; Ex. 1053 ¶ 29. As can be seen for the version of Figure 2 modified by Patent Owner to show parallel view pyramids, a sufficient field of view for the face and torso is within the binocular area if the subject is moved further from the camera. *See* PO Resp. 14 (modifying Ex. 1020, Fig. 2); *see also* Ex.

1053 ¶ 29 (testifying that moving further away “[i]f no other changes were made, . . . would slightly lower the 3D resolution of the surface captured by the device compared to using angled frustrums,” “[h]owever, in this application area a slight decrease in resolution is acceptable”).

In sum, we find that the ’119 Specification does not address optical axes and does not serve to limit the plain and ordinary meaning of this limitation so as to exclude parallel sub-optics.

3. *Prosecution History*

We now turn to the prosecution history the ’119 patent. The prosecution history “can often inform the meaning of the claim language by demonstrating how the inventor understood the invention.” *Phillips*, 415 F.3d at 1317. Such is the case here.

In particular, Patent Owner treated the “according to two different angles” language differently during prosecution than it does now. During prosecution, the Examiner rejected the challenged claims over Hoffmeier⁹ and concluded that Hoffmeier disclosed a stereophotogrammetry device comprising “two sub-optics (2b) and (2c) configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1002, 63–66; Ex. 1053 ¶ 12; Pet. Reply 1–3. Hoffman’s Figure 3 depicts its device and illustrates two views of its subject in Figure 4. Ex. 1005 ¶¶ 25–26; Ex. 1053 ¶ 13. We reproduce these two figures side by side below.

⁹ US 2011/0175987 A1, published July 21, 2011 (Ex. 1005)

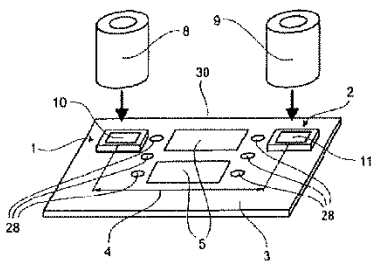


FIG. 3

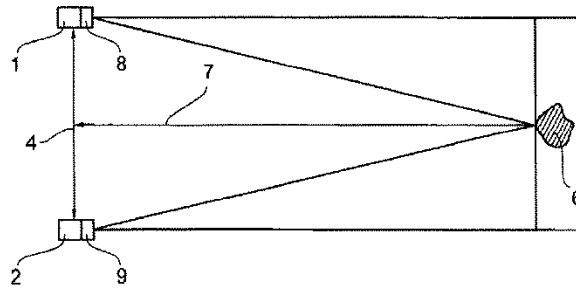


FIG. 4

Ex. 1005, Figs. 3–4. Hoffman’s Figure 3 is a perspective view of the Hoffman system. *Id.* ¶ 25. Hoffman’s Figure 4 “shows a schematic structure of a stereo camera system with the Hoffman stereo camera system board.” *Id.* ¶¶ 10, 26. The evidence supports that Hoffman’s lenses face forward rather than at an angle. *Id.* at Figs. 3–4, ¶ 37 (“The two optical systems 8, 9 can be coupled to the board 3 such that the respective optical axis of an optical system 8, 9 runs through the center point of the image sensing area 10, 11 of an image detection sensor 1, 2”); *see also* Ex. 1053 ¶ 14 (Petitioner’s expert opining that Hoffmeier’s Figure 4 “shows components 8 and 9 as having parallel axes”).

During prosecution, Patent Owner submitted of a statement of its CEO and ’119 patent inventor, Jean-Philippe Thirion, responding to the rejection. Ex. 1002, 88–107; Ex. 2019 ¶ 8. Importantly, in that submission, Patent Owner admitted that Hoffmeier teaches claim 1’s “two different angles” recitation as follows:

Being devoid of any positioning system external to the stereovision system itself makes Hoffmeier quite different from the invention described in ’981 [(referencing the ’981 application that led to the ’119 patent)]. Hoffmeier therefore discloses “A device for stereophotogrammetry comprising a camera body (1) and a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views

according to two different angles” as in claim 1 of ’981, but it is all that Hoffmeier discloses relative to claim 1 of ’981.

Ex. 1002, 92 (bold emphasis added). Patent Owner further admitted that “8 and 9 in FIG 3 of Hoffmeier exactly correspond to 2b and 2c in FIG 2 of [the ’119 patent].” *Id.* at 91–92.

Patent Owner’s admissions during prosecution suggest to the public that Patent Owner understood that spaced optics with parallel optical axes may, nonetheless, fall within the scope of claim 1. Patent Owner now downplays these admissions by arguing that Hoffmeier “is ambiguous as to whether the optical axes of 8, 9 are angled inwards, or are parallel.” PO Sur-reply 8. Although we agree Hoffmeier is ambiguous in this regard, the ambiguity does not help Patent Owner’s position. Rather, despite ambiguity, Patent Owner admitted that Hoffmeier taught “two views according to two different angles.” Ex. 1002, 92. The prosecution history, thus, suggests that Hoffmeier’s optical axes orientation is not important to whether the “two different angles” recitation is met. As such, Patent Owner’s prosecution history statement aligns with the present arguments of Petitioner, not Patent Owner.

4. *Parallel Litigation*

During district court litigation involving the ’119 patent, Patent Owner responded to Petitioner’s invalidity allegations regarding the Plassmann reference by agreeing that Plassmann teaches the now disputed “according to two different angles language”:

QuantifiCare agrees that the quoted language and figure include, *inter alia*, a double-optics comprising two sub-optics configured for a simultaneous acquisition of two views according to two different angles.

Ex. 1037, 2; *see also* Pet. Reply 6.

Patent Owner now disputes that Plassmann teaches this recitation. *See, e.g.*, PO Resp. 27–30 (arguing that Petitioner’s contention that Plassmann acquires “two views according to two different angles” is incorrect). Thus, Patent Owner’s position in the district court litigation was consistent with its position during prosecution but inconsistent with its position in the current proceeding.¹⁰ Thus, this inconsistency at least somewhat weighs against Patent Owner’s arguments.

In addition, we find unavailing Patent Owner’s argument that its agreement was subject to an objection that Petitioner failed to identify specifically where in Plassmann the limitation was taught. PO Sur-reply 8 (Ex. 1037, 2). Rather, Petitioner identified Plassmann’s Figure 1B and a passage describing it, which is the same structure Petitioner relies on here. Ex. 1037, 2.

In addition, we find unavailing Patent Owner’s argument that this issue was raised belatedly by Petitioner. PO Sur-reply 8. As we discuss above, Petitioner may make this argument because it is responsive to issues of claim construction Patent Owner raises in its Response. CTPG, 45.

5. *Summary*

In view of the record as a whole, the weight of the evidence supports that claim 1’s “two views according to two different angles” language does not require that the optical axis of each sub-optic be angled differently but

¹⁰ Patent Owner argues that this extrinsic evidence should be disregarded. PO Sur-reply 8–9. We disagree. While the extrinsic evidence is entitled to less weight, it nonetheless bolsters the intrinsic evidence establishing that Patent Owner—outside of the instant proceeding—understood “two views according to two different angles” in accordance with Petitioner’s claim construction.

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instead requires only that the sub-optics view the subject from different angles. Put differently, we conclude that this disputed limitation covers configurations of the two sub-optics that are spaced, regardless of whether the sub-optics' optical axes are orientated in parallel.

C. Principles of Law

“In an [inter partes review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring inter partes review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

A claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time of the invention to a person having ordinary skill in the art. *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of non-obviousness, if present. *See Graham*, 383 U.S. at 17–18. When evaluating a claim for obviousness, we also must “determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

D. Objective Indicia of Non-Obviousness

Patent Owner argues that considerations of “commercial success, copying, long-felt need, and praise for the invention, further demonstrate non[-]obviousness.” PO Resp. 55–67.

Objective indicia of nonobviousness may include long-felt but unsolved need, failure of others, unexpected results, commercial success, copying, licensing, industry praise, and expert skepticism. *Mintz v. Dietz & Watson, Inc.*, 679 F.3d 1372, 1379 (Fed. Cir. 2012). Objective indicia are only relevant to the obviousness inquiry if there is a nexus between the claimed invention and the objective indicia of nonobviousness. *In re Affinity Labs of Tex., LLC*, 856 F.3d 883, 901 (Fed. Cir. 2017). A rebuttable presumption of nexus applies only “when [a patent owner] shows that the asserted objective evidence is tied to a specific product and that product ‘embodies the claimed features, and is coextensive with [the claims].’” *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (quoting *Polaris Indus. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1072 (Fed. Cir. 2018)). On the other hand, a patent owner is not entitled to a presumption of nexus if the patented invention is only a component of a commercially successful machine or process. *Id.* (reaffirming the importance of the “coextensiveness” requirement).

Applying *Fox Factory*, the Board uses a two-step analysis in evaluating nexus between the claimed invention and objective evidence of nonobviousness, also referred to as secondary considerations. *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 33 at 33 (PTAB Jan. 24, 2020) (precedential). We first consider whether Patent Owner has demonstrated “that its products are coextensive (or nearly coextensive) with the challenged claims,” resulting in a rebuttable presumption of nexus. *Id.* at 33. If not, that

“does not end the inquiry into secondary considerations”; “the patent owner is still afforded an opportunity to prove nexus by showing that the evidence of secondary considerations is the ‘direct result of the unique characteristics of the claimed invention.’” *Id.* (quoting *Fox Factory*, 944 F.3d at 1373–75). For the reasons discussed below, we find that Patent Owner does not demonstrate (i) that its products are coextensive with the challenged claims for a presumption to attach, and (ii) the requisite nexus with evidence that the secondary considerations are the direct result of the unique characteristics of the claimed invention.

1. Presumption of Nexus

Patent Owner argues that “its LifeViz Infinity (‘Infinity’) product is disclosed and claimed in the patent.” PO Resp. 55 (citing Ex. 2013 ¶ 213). Patent Owner argues that Petitioner “does not dispute this assertion.” *Id.* (citing Pet. 72). Patent Owner thus states that, “Therefore, nexus of secondary considerations regarding the Infinity to the invention is presumed.” *Id.* (citing *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1330 (Fed. Cir. 2016)).

We disagree. Patent Owner does not provide an analysis demonstrating that its Infinity product is coextensive (or nearly coextensive) with the challenged claims. Rather, Patent Owner cites to the following testimony of Dr. van der Weide: “I have reviewed the LifeViz Infinity device and conclude that it embodies the invention of the [’]253 Patent. More specifically, the Infinity possesses all the features listed in claim 1 of the patent.” *Id.* (citing Ex. 2013 ¶ 213). Simply put, Patent Owner fails to provide any analysis whatsoever. *Id.*; *see also* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”).

Moreover, Patent Owner's reliance on *WBIP* is misplaced. In that decision, "WBIP presented evidence that specific products . . . [we]re embodiments of the invention as claimed in the asserted claims," and that provided a basis for finding a presumption of nexus. *WBIP*, 829 F.3d at 1329–31. Such is not the case here.

In sum, Patent Owner does not provide the required analysis demonstrating that Infinity is coextensive (or nearly coextensive) with the challenged claims. PO Resp. 55; *Lectrosonics*, Paper 33 at 33. We, therefore, find that a presumption of nexus is inappropriate.

2. Direct Result of the Unique Characteristics of the Claims

For the second step of our analysis, we look to whether Patent Owner demonstrates the requisite nexus with evidence that any secondary considerations are the direct result of the unique characteristics of the claimed invention. In particular, we address below Patent Owner's arguments directed to the secondary considerations of (i) commercial success, (ii) copying, (iii) long-felt need, and (iv) praise for the invention. PO Resp. 55–67.

a) Commercial Success

For the commercial success indicia to support nonobviousness, Patent Owner needs "to show both commercial success and that a nexus exists between that success and the merits of the claimed invention." *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1350 (Fed. Cir. 2012). We start with the latter of these requirements and look to Patent Owner's arguments that a nexus exists between the purported commercial success and the challenged claims.

First, Patent Owner argues that "[a] nexus between sales of Infinity and the claimed invention is presumed because Infinity 'is the invention

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disclosed and claimed in the patent.” PO Resp. 61 (citing *WBIP*, 829 F.3d at 1330). We find this argument unavailing because as we find above, Patent Owner does not demonstrate that a presumption should attach. *See supra* Section (V)(A).

We also find unavailing Patent Owner’s argument that “customers have identified claimed features as important to their use of the invention.” PO Resp. 61 (citing PO Resp. 59–60 (arguing that the claimed invention has received praise)). This argument does not address whether any sales, for example, of the Infinity product were owed to the merits of the claimed invention, nor that such purported praise lead to actual demand.

We also find unavailing Patent Owner’s argument that “Infinity sales were due to claimed features of the invention, *e.g.*, its ‘dual-distance’ functionality, which permitted customers to avoid buying multiple products or a non-portable multi-head system to accomplish the same tasks – as was noted by the EuroMediCom press release.” PO Resp. 62 (citing Ex. 2020,¹¹ 4). The announcement identifies the Infinity product as “BEST AESTHETIC DEVICE,” and describes the product, but does not evidence any specific demand for, or sales of, the Infinity product due to any features of the challenged claims. *See* Ex. 2020, 4. Nor does Patent Owner sufficiently address whether dual-distance functionality comprises the unique characteristics of the claimed invention.

We also find unavailing Patent Owner’s argument that “[t]he primary functional difference between [Petitioner’s] H2 and H1 [products] is that H2 can image the body (at a different distance) in addition to the face,” and that

¹¹ *Winners 2018-2019*, EuroMediCom (Jan. 29, 2021) <https://www.euromedicom.com/mca-2018/en/trophy/Winners-2018-2019.html>.

“[i]t follows that the large differential in production of the H2 as compared to H1 is due to that additional functionality.” PO Resp. 62 (citing Ex. 2034¹² (arguing that Vectra H1 images face only); Ex. 2030¹³ (arguing that Vectra H2 captures a face or body image). Patent Owner provides no evidence for why this purported differential in production occurred; rather, Patent Owner speculates.

Second, we do not find that Patent Owner demonstrates commercial success of the Infinity product. To establish commercial success, Patent Owner relies on a declaration from its CEO, Dr. Thirion. PO Resp. 61–64 (citing Ex. 2019 ¶¶ 29–37). Although Dr. Thirion provides evidence of increasing sales of Infinity, Dr. Thirion does not give any specific information about unit sales, revenue, or the Infinity’s market share relative to the greater medical imaging market. Ex. 2019 ¶¶ 29–37.

In addition, we find unavailing Patent Owner’s argument that Petitioner “does not contest that its H2 infringes, and thus its sales are relevant to the invention’s commercial success.” PO Sur-reply 25 (citing *Truswal Sys. Corp. v. Hydro-Air Eng’g, Inc.*, 813 F.2d 1207, 1215 (Fed. Cir. 1987) & n. 12 (citing Ex. 2013 ¶¶ 215–219). We find insufficient support for Patent Owner’s assertion that Petitioner does not contest infringement. And we find Patent Owner’s reliance on *Truswal* misplaced. First, we note that Patent Owner cites to Judge Rich’s dissent in *Truswal*. Second, Judge Rich stated the “once an infringer is sued *and proved to be an infringer*, its sales are appropriately proved and added to the others,” and that “[i]t is necessary to establish that the alleged copies are actual infringements of the patent in

¹² *Vectra H1 Quick Reference Guide*, Canfield (2014).

¹³ *Vectra H2: Capturing a FACE or BODY image*, Canfield.

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suit before they can possibly be relevant and counted as successes *of the patented invention.*” *Truswal*, 813 F.2d at 1215 (Rich, J., dissenting).
Petitioner, as of now, has not been proved to infringe.

In sum, we find that Patent Owner does not show sufficient nexus between the purported commercial success and the claimed invention and fails to show commercial success.

b) Copying

Patent Owner alleges that Petitioner’s Vectra H2 “is a copy of *the invention*, in structure, function, operation, and use.” PO Resp. 64–66 (emphasis added). Patent Owner argues that Petitioner’s the Vectra H2 mimics patented features and Infinity’s use of red and green light beamers. *Id.* at 64. Patent Owner emphasizes that Petitioner launched its H2 device “[e]ighteen months after Quantificare launched its Infinity.” *Id.* Based on these allegations, is unclear whether Patent Owner alleges that Petitioner copied Patent Owner’s patent disclosure, subject matter of Patent Owner’s patent claims, or Patent Owner’s Infinity device.

Petitioner argues that it did not copy Patent Owner’s invention and identifies technical distinctions between the parties’ products. Reply 29–30. Petitioner’s witness, Dr. Otto, credibly opines that Petitioner’s choice of red and green light beamers was made for functional reasons (it is easier to get bright LEDs in red and green than in other colors). *Id.* at 30 (citing Ex. 1053 ¶¶ 80, 81).

Here, Patent Owner lacks evidence that Petitioner copied the ’119 patent or any claim of the ’119 patent. Patent Owner has no evidence, for example, that Petitioner was aware of the ’119 patent during development of the H2 device. Patent Owner further lacks evidence that any particular aspect of the ’119 patent was copied. *In re GPAC Inc.*, 57 F.3d 1573, 1580

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(Fed. Cir. 1995) (“more than the mere fact of copying by an accused infringer is needed to make that action significant to a determination of the obviousness issue”) (citation omitted).

Patent Owner also lacks evidence that Petitioner copied any patented product. As we explain above, Patent Owner lacks evidence that the Infinity is coextensive or nearly coextensive with any challenged claim; the record, thus, does not establish that Infinity is a “patented product” in a relevant sense.

Moreover, our reviewing court has held that “copying requires evidence of efforts to replicate a specific product, which may be demonstrated through internal company documents, direct evidence such as disassembling a patented prototype, photographing its features, and using the photograph as a blueprint to build a replica, or access to the patented product combined with substantial similarity to the patented product.” *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010). Here, Patent Owner lacks evidence that Petitioner studied any Patent Owner product or documents when developing the H2 device. Just to the contrary, the preponderance of the evidence supports that Petitioner’s H2 product differs from Patent Owner’s product because it refocuses at different distances (a design present in prior art systems). Ex. 1053 ¶¶ 79–81; *see also* Reply 29.

Thus, based on the record as a whole, Patent Owner’s allegation of copying is unpersuasive and does not support non-obviousness.

c) Long-Felt Need

Patent Owner argues that there was a long-felt need which the invention of the ’253 patent addresses. PO Resp. 55–59; PO Sur-reply 26. First, Patent Owner argues that in 2007, it “developed and launched the LifeViz stereophotogrammetry camera,” which “was a portable, handheld,

single camera device with one pair of beamers converging at the focus distance of the camera, and subjects were imaged at that distance.” PO Resp. 57 (citing Ex. 2019 ¶¶ 9–12).

Second, Patent Owner argues that “[a]t the time of invention [of the ’253 patent], there were no portable, ‘all-in-one’ handheld stereophotogrammetry devices for imaging both face and breast/torso.” *Id.* at 58 (citing Ex. 2019 ¶¶ 25–26, 29). “To image both, practitioners had to purchase one device for face and one for breast/torso, or purchase the large, costly multi-head Canfield XT,” which had disadvantages, according to Patent Owner. *Id.* (citing Ex. 2019 ¶¶ 25–26, 29; Ex. 1001, 1:49–52).

Patent Owner argues that “[a]ccordingly, since at least the 2007 introduction of LifeViz, there was a long-felt need for a portable single-camera stereophotogrammetry device that avoided the disadvantages of purchasing multiple devices or a multi-head device like the Canfield XT.” *Id.* at 58–59 (footnote omitted) (citing Ex. 2013 ¶ 212; Ex. 2019 ¶ 30; Ex. 2020, 4). “To address that deficiency, [Patent Owner] developed Infinity in 2015, filed for a patent thereon on October 14, 2015, and began commercial sales one year later,” according to Patent Owner. *Id.* at 59 (citing Ex. 2019 ¶¶ 28–29). Patent Owner argues that its Infinity product satisfied the long-felt need as demonstrated by industry praise and commercial success. *Id.* (citing Ex. 2019 ¶ 30; Ex. 2020, 4). Patent Owner also cites for support Dr. Otto’s deposition testimony that “it ‘was desired to do breast imaging,’ there was ‘a big demand’ to image ‘both areas,[]’ and [Petitioner] ‘didn’t want to have a separate product to do breast imaging.’” PO Sur-reply 26 (citing Ex. 2037, 17:22–18:17).

We find that Patent Owner does not show that there was a long-felt need that the claimed invention addresses. “[L]ong-felt need is analyzed as

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of the date of an articulated identified problem and evidence of efforts to solve that problem.” *Texas Instruments Inc. v. U.S. Int’l Trade Comm’n*, 988 F.2d 1165, 1178 (Fed. Cir. 1993). Patent Owner does not show that the LifeViz product having only one pair of beamers converging at one distance was identified as a problem needing solution in 2007. *See* Ex. 2019 ¶¶ 9–12. Rather, Dr. Thirion testifies to the capabilities of the 2007 LifeViz product. *Id.* That a later generation product, such as Infinity, has additional capabilities does not evidence that a long-felt need existed and was met. Rather, evidence must be provided that shows there was an articulated identified problem and efforts to solve that problem, which Patent Owner does not do. Nor does Patent Owner provide evidence that Infinity was met with skepticism or that persons of ordinary skill in the art tried and failed to achieve the claimed invention.

Nor are we persuaded that industry praise and commercial success alone is sufficient to evidence a long-felt need that the claimed invention addresses. Both can exist without a long-felt need having existed. *See* Ex. 2019 ¶ 30 (testifying that Infinity created a new market for sales, but not providing direct evidence that a long-felt need had existed in the industry); Ex. 2020, 4 (stating that Infinity “is the first portable 3D imaging system capable of capturing face, body, and breast areas thanks to two sets of dual beamer pointers which allow for two distance settings,” but without stating it met a long-felt need). Furthermore, Dr. Otto’s deposition testimony cited by Patent Owner does not evidence that there was a long-felt need that the claimed invention solved. Ex. 2037, 17:22–18:17.

In sum, we find that Patent Owner does not show that there was a long-felt need. Moreover, Patent Owner does not provide analysis to show

the requisite nexus between the purported long-felt need and the unique characteristics of the claimed invention.

d) Praise

Patent Owner argues that Infinity won a prestigious award, the 2018 EuroMediCom Best Aesthetic Device Award, and that this award establishes industry praise. PO Resp. 59–60. In addition, Patent Owner argues that this award has nexus with the invention. *Id.* To that end, Patent Owner quotes three portions of the EuroMediCom announcement, and argues that “[t]his praise is squarely directed to the claimed invention.” *Id.* at 59–60 (citing Ex. 2020, 4; Ex. 2013 ¶ 214).

Below we produce the entirety of the announcement, and we italicize the portions Patent Owner quotes in its Response.

The LifeViz® Infinity is the first portable 3D imaging system capable of capturing face, body, and breast areas thanks to two sets of dual beamer pointers which allow for two distance settings. This unique system has two acquisition modes. A tripod mounted camera and turntable quickly capture a 360° 3D body image. Eight images are automatically taken and seamlessly stitched to produce a “life-like[”] 3D image of the body for visualization by the physician and patient. In hand-held mode, the camera is capable of generating 3D images of face and breast to simulate procedures and photo-document before/after interventions, without blocking an entire exam room with cumbersome equipment.

With a simple flip of a switch, dual beam pointers adjust to the distance ideal for face or body applications without the need for cumbersome repositioning and/or multi-headed systems. Superior image quality has been achieved by improving the optic performance. The LifeViz® Infinity produces excellent pictures from both near and far thanks to an increased deep field of view. Finally, a powerful external flash removes the need for specific lighting conditions and additional equipment ensuring reproducible images from one session to the next. The LifeViz® Infinity is comprised of a portable stereovision camera, a

software suite including an image database, 3D viewer tool, 3D skin analysis, face, breast, and body measurements and simulation modules. All aspects of 3D documentation, comparison, simulation, and measurement ranging from medical to cosmetic applications are possible with this single unique device.

Ex. 2020, 4 (*italics emphases added*). As can be seen above, the announcement broadly describes the Infinity product, including many additional features that Patent Owner does not identify, such as “a tripod mounted camera and turntable”; “[e]ight images are automatically taken and seamlessly stitched to produce a ‘life-like’ 3D image of the body for visualization”; “a powerful external flash”; and “a software suite including an image database, 3D viewer tool, 3D skin analysis, face, breast, and body measurements and simulation modules.” *Id.*

Patent Owner does not show that the purported praise is a direct result of the unique characteristics of the claimed invention. The announcement touts additional features of Patent Owner’s product. Based on the announcement, we cannot assess whether praise for Patent Owner’s product is grounded in a claimed feature, other features, or a combination thereof. Patent Owner does not directly compare the announcement with the challenged claims and does not clearly identify what Patent Owner contends are the unique characteristics of the claimed invention being praised. Moreover, the challenged claims are of varying scope, and Patent Owner does not address those differences.

In addition, Patent Owner argues that three “medical professionals’ praise is directed to the claimed invention.” PO Resp. 60–61 (citing

Ex. 2021,¹⁴ 11, 19–20). In particular, Patent Owner quotes from Dr. Lee’s testimonial that “[a]lthough regular 2D pictures are inconvenient, capturing a face or body in 3D with the 3D LifeViz® Infinity is easier. First of all, you have a unique device for standardized photography with a switch that adjusts the ideal distance for face and body.” *Id.* at 60 (citing Ex. 2021, 19). Patent Owner does not relate this portion of Dr. Lee’s testimonial to the claims, including failing to show that the purported praise is a direct result of the unique characteristics of the claimed invention.

In addition, Patent Owner quotes from the testimonial of Dr. Karimi who states that Infinity is “a state of the art, easy to use photographic system that has become an essential part of our consultation for face and body procedures.” *Id.* at 61 (citing Ex. 2021, 20). And Patent Owner argues that “Dr. Myriam Fopp uses LV Infinity for face (‘Wrinkles, Pores’) and body,” and Dr. Fopp states that “[w]e also use our LifeViz® Infinity technology for body treatments.” *Id.* (citing Ex. 2021, 11). As above, Patent Owner does not relate these portions of Drs. Karimi’s and Fopp’s testimonials to the claims, including failing to show that the purported praise is a direct result of the unique characteristics of the claimed invention.

In sum, we find that Patent Owner does not show sufficient nexus between the purported praise and the claimed invention.

E. Ground One: Obviousness Based on Plassmann, Treuillet, and Staller

Petitioner asserts that the ’119 patent’s claims 1–4 and 8 would have been obvious over Plassmann, Treuillet, and Staller. Pet. 29–58. We provide

¹⁴ *Testimonials: What our customers say*, QuantifiCare
<https://www.quantificare.com/learn/testimonials/>.

an overview of Plassmann, Treuillet, and Staller before we address this ground.

1. *Plassmann (Ex. 1007)*

Plassmann is a World Intellectual Property Organization publication that relates to an apparatus for the production of stereoscopic images. Ex. 1007, at codes (10), (19), (57). Plassmann describes variations of the “MAVIS” system. *Id.* at 12:25–5. Plassmann’s apparatus captures “two images [which are] needed to form a stereo image . . . to produce a three-dimensional representation of the subject.” *Id.* at 12:25–29. The apparatus further includes two light emitting diodes (LEDs) emitting respective beams which converge at a particular distance in front of the apparatus. *Id.* at 12:7–13.

Below, we reproduce Plassmann Figures 1A and 1B.

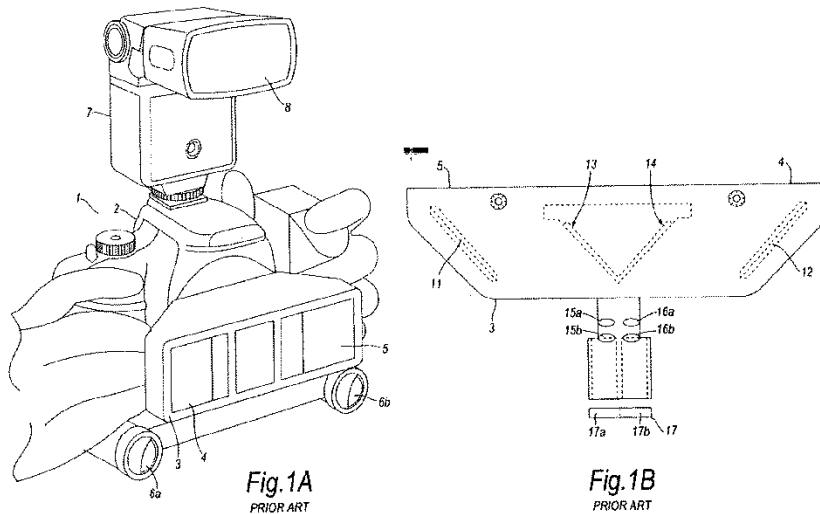


Figure 1A is a perspective representation of an apparatus for obtaining stereoscopic images, showing body 2, e.g., a camera, and adaptor 3. *Id.* at 11:3–4, 11:28–12:4. Further Figure 1B shows a “plan view” of adaptor 3 in further detail. *Id.* at 11:5–6, 12:13–14. Adaptor 3 has two apertures 4, 5

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which respectively collect light which is respectively focused onto charge coupled device parts 17a, 17b, forming respective first and second images. *Id.* at 12:15–25. The first and second images form a stereo image used to produce a three-dimensional representation of a subject. *Id.* at 12:25–29.

Additionally, as shown in Figure 1A, the apparatus includes

two low-powered light emitting diodes (LEDs) 6a, 6b, each provided with a [focusing] lens to produce a beam of light and being arranged so that the beams converge and meet at a point a fixed and desired distance from the apparatus, this distance corresponding to the distance at which the camera lens is [focused].

Id. at 12:8–13. The converging beams act as “a guide to show distance between the apparatus and subject.” *Id.* at 16:12–14.

2. *Treuillet (Ex. 1016)*

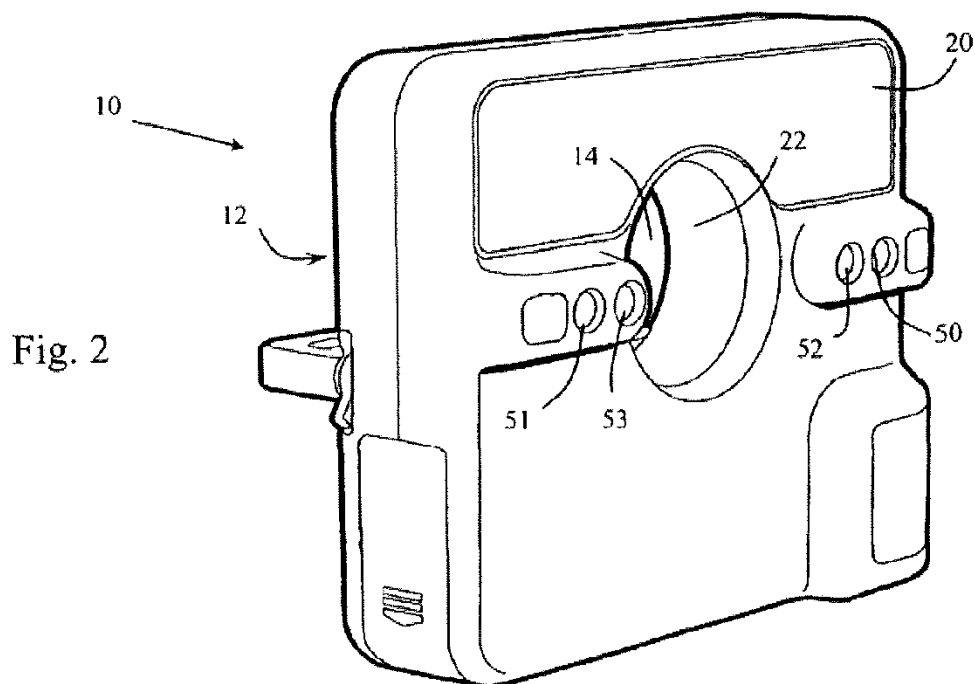
Treuillet is a paper that relates to an “approach to build 3-D models of skin wounds from color images.” Ex. 1016, 752. Treuillet explains that “[b]y taking two color images from different points of view, stereophotogrammetry allows the computation of the 3-D coordinates of numerous points on the skin lesion.” *Id.* at 754.

By way of imaging technology background, Treuillet describes the MAVIS II system as “a reflex digital camera equipped with special dual lens optics for recording two images from slightly different viewpoints, generating a stereo pair” which includes “two tube-shaped projectors produce beams of light which intersect in a single spot when the camera is held at the right distance” at “about 80 cm from the wound,” with a tolerance of plus or minus 15 cm. *Id.* at 755.

3. *Staller (Ex. 1006)*

Staller is a United States patent that relates to a diffuser attachment for a camera including a “distance measurement device [that] uses a pair of light beams which intersect at a repeatable distance from the diffuser body to readily enable positioning of an object to be photographed at that repeatable distance.” Ex. 1006, codes (10), (12), (57).

Below, we reproduce Figure 2, which shows a front perspective view of a diffuser. *Id.* at 3:13–14.



As shown in Figure 2, the diffuser “includes a distance measurement device or indicator in the form of a plurality of light beam emitters 50–53.” *Id.* at 5:13–15. “Each pair of emitters 50–51, 52–53 creates a pair of angled light beams which intersect at different distances in front of diffuser body 12.” *Id.* at 5:17–18. As such, “[e]ach of the pairs of light beams allows diffuser 10 to be relocated at the same repeatable 20 distance from a subject.” *Id.* at 5:18–

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21; *see id.* at Fig. 4. That is, each pair of emitters indicates a different distance. *Id.* at 2:30–35; *see id.* at 5:64–6:2.

Further, either of the emitter pairs, i.e., pair 50–51 or pair 52–53, are selected using a selector switch. *Id.* at 5:38–41. By selecting a particular emitter pair, the distance measurement device indicates a particular distance measurement. *See id.*

4. Discussion

Because Petitioner’s ground requires combining the teachings of Plassmann, Treuillet, and Staller (Pet. 5), we first address motivation to combine. *See KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring “articulated reasoning with some rational underpinning to support the legal conclusion as to obviousness”)). We then address the recitations of each claim that this ground addresses.

a) Reason to Combine

Petitioner relies on Plassmann as teaching most of claim 1’s recitations. For example, Plassmann teaches a stereoscopic adaptor and teaches one pair of light beamers producing intersecting light beams to position a subject within Plassmann’s depth of field. Pet. 17, 34–36; Ex. 1003, Figs. 6a, 6b, ¶ 111. Petitioner does not allege that Plassmann, by itself, discloses claim 1’s recitations regarding two pairs of light beamers converging on two different point positions.

To explain why the two pairs of light beamers recitations nonetheless would have been obvious, Petitioner relies on Treuillet and Staller. Petitioner’s declarant, Dr. Paul Otto, testifies that a person of skill in the art would have understood that the Plassmann device “has a depth of field which contains many distances at which ‘the camera lens is focused.’”

Ex. 1003 ¶ 113. Petitioner relies on Treuillet to confirm that Plassmann was capable of an expanded depth of field. Pet. 36; Ex. 1003 ¶ 113.

Petitioner persuasively argues that Treuillet teaches that the Plassmann MAVIS II device may take acceptable wound photographs from 65 centimeters to 95 centimeters (within its “depth of field”). Pet. 36; Ex. 1003 ¶ 113; Ex. 1016, 755. A person of skill in the art would have understood that acceptable medical wound photographs would have to be adequately focused and that Treuillet, therefore, suggests a depth of field from 65 centimeters to 95 centimeters for the Plassmann device. Ex. 1003 ¶ 113 (explaining that a person of skill in the art would understand that Plassmann has an expanded depth of field because it can “accurately image a subject at multiple positions”).

Petitioner then relies on Staller as teaching multiple light beamers to define more than one imaging position within a depth of field. Pet. 41–42; Ex. 1006, Fig. 4, 2:29–34, 5:56–6:2. Staller teaches plurality of pairs of light beams that “intersect at a different repeatable distance from the diffuser body.” Pet. 23; Ex. 1006, code (57), 2:29–32, 5:13–15; *see also id.* at 5:56–6:2 (“[T]wo pairs of light beam emitters . . . may be used to provide three or four separate pairs of intersecting bea[m]s and three or four corresponding repeatable distances for diffuser 10.”). In other words, Staller teaches having at least two distinct predefined distance positions for the camera. Ex. 1006, code (57), 2:29–32, 5:13–15, 5:56–6:2. The advantage of the plurality of pairs of light beams is taught by Staller: repeatability. Ex. 1006, 6:10–15 (referring a concern for “repeatable scale” to “improve[] the usefulness of close range photographs for medical” applications).

Petitioner persuasively argues that a person of skill in the art would have been motivated to predefine two distances from a device in order to

provide for varying levels of magnification. Pet. 45–46. Petitioner persuasively explains that a person of skill in the art would have had a reasonable expectation of success in combining the references’ teachings. *Id.* at 46–47.

Patent Owner argues that a person of ordinary skill in the art would not have “add[ed] beamers converging where Plassmann’s camera is less than optimally focused so as to purposely obtain images of degraded focus and quality.” PO Resp. 31 (citing Ex. 2013 ¶¶ 142, 154–155). Patent Owner first argues that image focus is critical to patient treatment and that a person of skill in the art would understand that a person using Plassmann would want high image quality. *Id.* at 31–33. Patent Owner then argues that, in view of the criticality of image sharpness to wound measurement, a person having ordinary skill in the art would not modify Plassmann to “image at a distance of degraded focus.” *Id.* at 34 (emphasis omitted); *see also* PO Sur-reply 17–20 (making similar arguments that optimal focus to ensure precision and accuracy of the image of a wound).¹⁵ Patent Owner emphasizes that Plassmann refers to “*the* distance at which the camera lens is focused” and that this is a singular distance of optimal focus. *Id.* at 35

¹⁵ Patent Owner refers to Exhibits 2039 and 2040 in its Sur-reply. Patent Owner used these exhibits (which Petitioner served on Patent Owner, but did not file in this proceeding) during a deposition of Dr. Otto, and filed them in this proceeding with its Sur-reply, which is late under our Rules. *See* Paper 41 (Order), 3 (authorizing refiling of exhibits to correct numbering, but stating that “this order does not address the merits of whether or not the exhibits at issue are proper”). We consider these exhibits in evaluating Dr. Otto’s testimony, but “not as evidence supporting [Patent Owner’s] arguments on the merits.” *Ascend Performance Materials Operations LLC, v. Samsung SDI Co.*, IPR2020-00349, Paper 53, at 12 (PTAB. July 15, 2021). Regardless, the disclosures in these exhibits do not change our depth of field analysis.

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(citing Ex. 1007, 12). Patent Owner emphasizes that other art such as Treuillet also refers to a single point of optimal distance. *Id.* at 36–40. Patent Owner’s witness, Dr. van der Weide, testifies that image will degrade if distance moves away from the optimally focused position and that a person of skill in the art would, thus, not modify Plassmann to include additional beamers. Ex. 2013 ¶¶ 146–189.

Patent Owner’s argument is unavailing because stereophotogrammetry devices having depth of field were known in the art. Ex. 1003 ¶¶ 113, 115, 385; Pet. Reply 19; *see Randall Mfg. v. Rea*, 733 F.3d 1355, 1362–63 (Fed. Cir. 2013) (providing that it is appropriate to consider such knowledge as part of an obviousness analysis). For example, Treuillet teaches with respect to the MAVIS II stereophotogrammetry device that “[t]o simplify the image capture, two tube-shaped projectors produce beams of light which intersect in a single spot when the camera is held at the right distance (about 80 cm from the wound),” and that “[e]xact positioning is not required: images can be taken in a volume of ± 15 cm around this point.” Ex. 1016, 755. This teaching supports that exact positioning is not required and that images can be taken within a 30 cm region evidences the depth of field for the MAVIS II. Ex. 1016, 755; Ex. 1053 ¶¶ 55–56.

Similarly, we find unavailing Patent Owner’s argument that Treuillet’s teaching that the beams of light intersect at “the right distance” equates to “the distance of optimal focus or where the image is sharpest,” and limits the MAVIS II to using that distance. PO Resp. 36 (citing Ex. 1016, 755; Ex. 2013 ¶154). This teaching refers to reaching the pre-defined distance, rather than limiting the depth of field. Ex. 1016, 755. We also find unavailing Patent Owner’s arguments that Treuillet teaching that “images can be taken in a volume of ± 15 cm” does not teach a depth of field, and

that “[c]an’ is not ‘should.’” PO Resp. 41–42 (citing Ex. 2013 ¶¶ 180–182). The references’ teachings correspond to what depth of field means and “can” expresses that capability of taking focused images within the depth of field. Ex. 1016, 755; Ex. 1003 ¶ 37; Ex. 2006 ¶ 47; Ex. 1001, 6:15–16; Ex. 1020, 4:20–24.

In addition, Hoeffelin¹⁶ teaches a stereophotogrammetry device having a 40 cm depth of field, which is sufficient to image both the face and torso. *See* Ex. 1015, 8–9 (disclosing “that the focal length needs to be respected (between 80 and 120 cm)”; Ex. 1003 ¶ 169; Ex. 1053 ¶ 61. We find unavailing Patent Owner’s argument that Hoeffelin teaches that “the focal length needs to be respected,” or otherwise brings risk of distortion. PO Resp. 36–37 (citing Ex. 1015, 8–9; Ex. 2013 ¶ 156). Patent Owner ignores the “(between 80 and 120 cm)” range that immediately follows and modifies the focal length statement, and expresses a depth of field. Ex. 1015, 8–9.

Moreover, we find unavailing Patent Owner’s arguments to the extent that they focus only on Plassmann’s depth of field. *See* PO Resp. 31–36; PO Sur-reply 17–20. These arguments are directed to Plassmann’s teachings individually, which is the incorrect focus. *Cf. In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (“Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references”); *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). In addition, these arguments are akin to arguing that Plassmann and Treuillet’s teachings cannot be physically combined, which

¹⁶ H. Hoeffelin, et al., *A Methodological Evaluation of Volumetric Measurement Techniques including Three-Dimensional Imaging in Breast Surgery*, BioMed Research Int’l, vol. 14, 8 (Jan. 2014) (Ex. 1015).

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is an improper focus for determining non-obvious. *See Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (quoting *In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983)); *see also id.* (quoting *In re Etter*, 756 F.2d 852, 859 (Fed. Cir. 1985) (en banc)) (“Etter’s assertions that Azure cannot be incorporated in Ambrosio are basically irrelevant, the criterion being not whether the references could be physically combined but whether the claimed inventions are rendered obvious by the teachings of the prior art as a whole.”).

We also find unavailing Patent Owner’s argument that that there would be no reason to combine Staller’s teachings with Plassmann because Plassmann has no need for additional beamers to provide repeatable scale. PO Resp. 38–40. More specifically, Patent Owner argues that “with Plassmann, the scale of the 3D reconstruction is already known exactly from the calibration and triangulation methodology,” and “[t]herefore, Plassmann already enables wound images to be viewed over successive examinations at repeatable scale(s) and at varying levels of magnification.” *Id.* (citing Ex. 2013 ¶ 165). Even if, as Patent Owner argues, one of ordinary skill in the art could develop or utilize different solutions to address scale, this does not make Staller’s solution less obvious. *Cf. Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (“[A] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.”). Moreover, the ability to consistently take images from different positions using multiple beamers would still have utility.

We also find unavailing Patent Owner’s argument that “Treuillet criticizes MAVIS II, calling it ‘cumbersome’ and stating ‘all the previous systems are unsuitable for general use in clinical settings.’” PO Resp. 43–44

(quoting Ex. 1016, 752, 755, 761). Patent Owner further argues that Treuillet criticizes that Plassmann's MAVIS II requires "careful calibration." *Id.* at 44. These arguments, however, do not undermine our finding above that a person having ordinary skill in the art would have understood that the MAVIS II device had a useable depth of field and that Plassmann would benefit from having multiple positioning beamers within that depth of field. Treuillet does not denigrate the notion of using multiple beamers with MAVIS II. *Cf. In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004) ("The prior art's mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the [claimed solution].").

We also find unavailing Patent Owner's argument that the "MAVIS II" device that Treuillet describes is not the same as the "MAVIS" device Plassmann refers to. PO Resp. 41. The preponderance of the evidence supports that a person of ordinary skill in the art would have understood that a "MAVIS" device of the Plassmann reference, regardless of whether or not it was precisely the same as MAVIS II, would have had the same depth of field (or, at a very minimum, some usable depth of field). In particular, Dr. Plassmann referred to MAVIS as also having a 30 centimeter depth of field. Exhibit 2040 (originally marked Exhibit 1048 during deposition) is an article by Dr. Plassmann entitled "Accuracy and Precision of the Hand-Held MAVIS Wound Measurement Device." In that article, Dr. Plassmann explains that the MAVIS includes a projector that "produces two beams of light that intersect at the centre of the middle of the field of view and in halfway in the field of depth (approximately 80 cm in front of the camera)." Ex. 2040, 3; *see also* Ex. 1054, 120:9–12 (inventor, Dr. Thirion, testifying that he saw the Exhibit 2040 article before filing the application leading to

the '119 patent). Also, the '119 patent's inventor, Dr. Thirion, acknowledged that the device from the Plassmann reference resemble[d] the MAVIS II system." Ex. 1054, 85:19–88:1. Dr. Otto also testifies that a person of ordinary skill in the art would have understood that the Plassmann article refers to the "MAVIS II" device when using the term "MAVIS." Ex. 1003 ¶ 114.

Patent Owner does not persuasively dispute that Plassmann's device would have some depth of field. Rather, Patent Owner's witness, Dr. van der Weide, admits that every stereophotogrammetry device has some depth of field. Ex. 2006 ¶ 78 ("[A] stereophotogrammetry device does not have zero depth of field."); *see also* Ex. 1054, 119:11–16 (the '119 patent's inventor, Dr. Thirion, stating that "every camera has a depth of field"). Patent Owner also does not present persuasive evidence disputing that a person of skill in the art would have understood that the Plassmann's MAVIS device would have the depth of field described in Treuillet.

Thus, in light of the above, we find that one of ordinary skill in the art would have found it obvious to modify Plassmann's stereophotogrammetry device, based on what was known in the art, to have multiple predefined distance positions for repeatability. Plassmann already teaches use of one pair of light beams for positioning, and a person of skill in the art would have understood that the Plassmann device could benefit from multiple pairs of light beams in the same way the Staller device benefits from the multiple pairs of light beams to enable positioning at more than one repeatable distance from the camera. Ex. 1003 ¶¶ 138–139. As the Supreme Court has explained:

[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would

improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill, . . . [A] court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.

KSR, 550 U.S. at 417 (emphasis added).

c) Claim 1

We next address obviousness of each claim recitation starting with claim 1.

The preamble of claim 1 recites “[a] device for stereophotogrammetry comprising.” For purposes of our analysis, we do not need to decide whether or not this preamble is limiting. Even if the preamble were limiting, the preponderance of the evidence supports that Plassmann discloses a device for stereophotogrammetry. Pet. 30–31; Ex. 1007, Figs. 1A, 1B, 12:25–29; Ex. 1003 ¶ 103. Patent Owner does not persuasively dispute this recitation.

Claim 1 next recites “a camera body.” As Petitioner argues, the preponderance of the evidence supports that Plassmann discloses a camera body. Pet. 31; Ex. 1007, Fig. 1A, 5:29–30, 12:3–4; Ex. 1003 ¶ 105. Petitioner adds that Plassmann teaches using “a camera body such as is well-known to those skilled in the art.” *Id.* at 30 (quoting Ex. 1007, 5:29–30, 12:3–4). Patent Owner does not persuasively dispute this recitation.

Claim 1 next recites “a double-optics (2) comprising two sub-optics (2*b*) and (2*c*), configured for a simultaneous acquisition of two views according to two different angles.” Pet. 32–34 (citing Ex. 1007, 21:14–25, Fig. 1B; Ex. 1003 ¶¶ 107–110). As Petitioner argues, the preponderance of the evidence supports that Plassman teaches this recitation.

Petitioner annotates Plassmann’s Figure 1B, which we reproduce below with Petitioner’s annotations. Pet. 33.

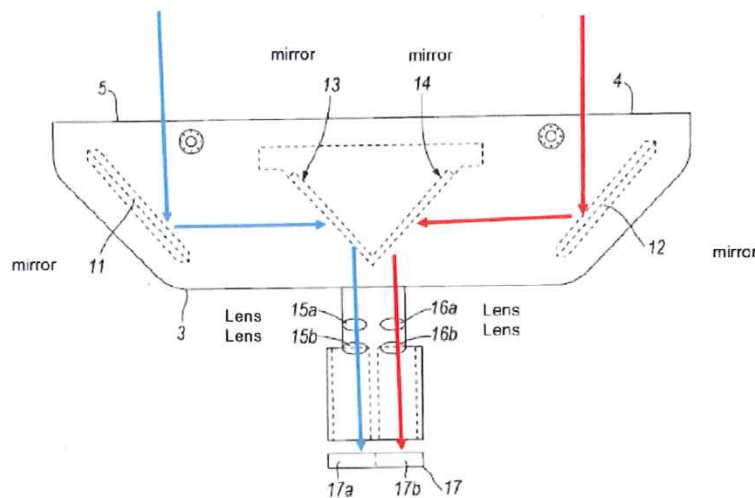


Fig. 1B
PRIOR ART

Plassmann's Figure 1B depicts a plan view of an adaptor used with the MAVIS apparatus. Ex. 1007, 11:5–6, 11:25–12:29. Petitioner annotates Figure 1B with red and blue lines to illustrate that Plassmann “comprises double-optics employing two sets of sub-optics (i.e.,] 11, 13, 15a, and 15b (blue) and 12, 14, 16a, and 16b (red)).” Pet. 34.

Petitioner persuasively argues that “Plassmann’s Figure 1B is substantially identical to the ’119 patent’s figures depicting the claimed double optics and two sub-optics.” Pet. 33–34 (citing Ex. 1007, Fig. 6; Ex. 1003 ¶¶ 108–109). Petitioner argues that Plassmann teaches, for example, that light forming the first image (depicted by blue annotations) hits the adaptor, hits mirror 11 and then mirror 13 before passing through lenses (15a,b). *Id.* at 20–21 (citing Ex. 1007, 12:14–22; Ex. 1003 ¶ 78). According to Petitioner, one of ordinary skill in the art “would recognize that the combination of mirrors and lenses traversed by each light path in Plassmann . . . comprises double-optics employing two sets of sub-optics (*i.e.* 11, 13,

15a, and 15b (blue) and 12, 14, 16a, and 16b (red)) as recited.” *Id.* at 34 (citing Ex. 1003 ¶ 109). Petitioner adds that “because of the spaced mirrors 11 and 12, the two images are necessarily taken at different angles.” *Id.* In addition, Petitioner argues that “[b]ecause the images are captured using a single camera . . . [one of ordinary skill in the art] would understand that they are obtained simultaneously.” *Id.*

We agree with Petitioner and find that one of ordinary skill in the art would have recognized that the combination of mirror and lenses comprises double-optics employing two sets of sub-optics (*i.e.* 11, 13, 15a, and 15b (blue) and 12, 14, 16a, and 16b (red)). Ex. 1007, 12:14–25, Fig. 1B; Ex. 1003 ¶ 235; Pet. 32. More specifically, we agree with Petitioner and find that Plassmann teaches having two sub-optics, which are displaced from one another, and which each collect light from the subject to be imaged (viewed). *See, e.g.*, Ex. 1007, 12:14–25, Fig. 1B. Plassmann teaches that the light collected by each sub-optic comprises the light that passes through the respective aperture 4 or 5, and traverses different sets of mirrors and lenses to be focused on a different part of a charged coupled device to form respective first and second images (views). *Id.* at 12:14–25, Fig. 1B.

We also agree with Petitioner and find that due to spaced mirrors 11 and 12—which are part of different light paths and which are hit by the light that passes through their respective aperture 4 or 5—the two images (views) are necessarily acquired at different angles. Ex. 1007, 12:14–25, Fig. 1B; Ex. 1003 ¶ 235; Pet. 32. Moreover, each sub-optic receives light from, for example, the center point of the object to be imaged from a different angle due to the spaced mirrors 11 and 12, as well as depending on the curvature of the subject and which point on the subject from which the light originates. *Id.*; *see also* PO Resp. 28 (admitting that “[i]t is true that, when a subject is

imaged using a stereophotogrammetry device having two sub-optics, the ‘angle’ between a point of the subject and each sub-optic is different”).

In addition, the ’119 patent Specification describes the claimed double optics as follows: “A double optics (2) adapted to the camera body (1) and composed of two sub-optics (2b) and (2c), enabling the acquisition of a stereo pair corresponding to two slightly different viewing angles.” Ex. 1001, 8:24–27. Notably, the passage provides that having two sub-optics enables acquiring a stereo pair “corresponding to two slightly different viewing angles,” without addressing the sub-optics’ orientation. *Id.*

Lastly, we agree with Petitioner and find that because images (views) are captured using a single camera, one of ordinary skill in the art would have understood they are obtained simultaneously. Ex. 1003 ¶ 235.

We find unavailing Patent Owner’s arguments disputing that Plassmann teaches this limitation. PO Resp. 23–30. Patent Owner’s arguments are premised on its construction (which we do not adopt) of the plain and ordinary meaning for this limitation which excludes parallel view sub-optic configurations. *Id.* Put differently, Patent Owner argues that having the sub-optics spaced apart from each other is insufficient to teach “two views according to two different angles.” *Id.* As we discuss above, this is incorrect. Thus, Patent Owner’s discussions regarding the optical axes of the sub-optics and their orientations are inapposite in light of the proper construction for “two views according to two different angles.” *Id.*

Moreover, we afford the testimony of Dr. van der Weide, Patent Owner’s declarant, little weight with regard to this issue, as it is based on the incorrect claim construction for “according to two different angles,” and

does not explain otherwise a basis for the testimony that the two images are acquired at the same angle. Ex. 2013 ¶¶ 113–141.¹⁷

In sum, we are persuaded that Petitioner demonstrates by a preponderance of the evidence that Plassmann teaches “a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views according to two different angles.”

Claim 1 next recites “wherein the device is comprising a positioning system (34) configured to define a position of a target subject (S) for one of at least two distinct pre-defined point positions (A3, A4) of the target subject (S) relative to the stereophotogrammetry device.” Ex. 1001, 11:32–57. As Petitioner argues, the preponderance of the evidence supports that the combination of Plassmann, Treuillet, and Staller teaches or suggests this limitation and, as we explain above, the evidence supports that a person of ordinary skill in the art would have had reason to combine these references’ teachings to meet this limitation with a reasonable expectation success. Pet. 34–40.

First, as Petitioner argues, the preponderance of the evidence supports that Plassmann teaches a positioning system that uses a pair of light beamers to signal when a target subject is reaching a predefined distance position to the camera. *See* Ex. 1007, Fig. 1A (light beamers 6a, 6b); Pet. 34–35. Plassmann teaches that these light beams converge at a predefined distance

¹⁷ Petitioner argues that Plassmann and its Figure 3A suggest that its sub-optics are angled inwardly such that this recitation would be met “[e]ven if the Board were to exclude parallel suboptics from the claims.” Pet. Reply 8. It is not necessary to reach this issue because we did not adopt Patent Owner’s construction.

“corresponding to the distance at which the camera lens is focused.”

Ex. 1007, 12:7–13. More specifically, Plassmann states the following:

The apparatus is also provided with two low-powered light emitting diodes (LEDs) 6a, 6b, each provided with a focussing lens to produce a beam of light and being arranged so that the beams converge and meet at a point a fixed and desired distance from the apparatus, this distance corresponding to the distance at which the camera lens is focussed.

Id.; Pet. 34–35. Accordingly, we find that Plassmann teaches the limitation, save for having a second predefined distance position—if there are two different distance positions, one necessarily is closer to the camera body and the other one farther. Ex. 1007, 12:7–13, Fig. 1A.

Second, as Petitioner argues, a preponderance of the evidence supports that Staller teaches a positioning system having more than one predefined imaging distance position. Pet. 41–42. More specifically, we find that Staller teaches a strobe diffuser attachment for a camera, which includes a “distance measurement device [that] may be adapted to selectively produce one of a plurality of pairs of light beams which intersect at different repeatable distances from the diffuser body.” Ex. 1006, code (57), 2:29–32, 5:13–15; *see also id.* at 5:56–6:2 (“[T]wo pairs of light beam emitters . . . may be used to provide three or four separate pairs of intersecting bea[m]s and three or four corresponding repeatable distances for diffuser 10.”); Pet. 38. In other words, Staller teaches having at least two distinct predefined distance positions for the camera. Ex. 1006, code (57), 2:29–32, 5:13–15, 5:56–6:2.

We also find that Staller teaches that its “distance indicator improves the usefulness of close range photography by providing a repeatable scale to photographs[, which] . . . improves the usefulness of close ranges

photographs for medical and other organic growth measurement applications.” Ex. 1006, 6:10–15. Plassmann also teaches that “[s]tereoscopic imaging has been known for many years,” and “ha[s] been used to measure the shape of wounds and the like which are otherwise difficult to measure by conventional techniques.” Ex. 1007, 1:6–15. We find that it was known in the art before the ’253 patent to use a camera having multiple predefined distances for imaging a subject in connection with wound or lesion treatment. *See* Ex. 1017,¹⁸ 579; Ex. 1011,¹⁹ 164, Fig. 2, Table 2; Ex. 1008,²⁰ 481.

Based on the record as a whole and as we explain when addressing reasons to combine, *supra* Sec. V.F.4.a, we determine that Petitioner has adequately established that a person of skill in the art would have had reason to modify Plassmann to include predefined distances as suggested by the combined teachings of Plassmann, Treuillet, and Staller.

Claim 1 next recites “wherein the device comprises a switch (5) comprising a first selection position configured to select the farther point position (A3) and a second selection position configured to select the closer point position (A4).” As Petitioner argues, a preponderance of the evidence supports that Staller teaches such a switch. Ex. 1006, Fig. 1, 5:38–43; Ex. 1003 ¶¶ 131–133; Pet. 43–44. Patent Owner does not persuasively dispute this point.

¹⁸ Gwen Clarke, *Recording Wounds: Polaroids New Medically Designed Camera*, British Journal of Community Nursing, vol. 5, no. 11 (Sept. 27, 2013) (“Clarke”).

¹⁹ Melvin A. Shiffman, *A New Camera for Cosmetic Surgery*, The Am. J. Cosmetic Surgery, vol. 15, no. 2 (June 1, 1998) (“Shiffman”).

²⁰ Clare Williams, *Wound care assessment with the Polaroid Macro 3 SLR*, British J. Community Nursing, vol. 6, no. 9 (2001) (“Williams”).

Claim 1 next recites “wherein the switch (5) is configured to switch on the first pair of light beamers (3*b*, 3*c*) in the first selection position and wherein the switch (5) is configured to switch on the second pair of light beamers (4*b*, 4*c*) in the second selection position.” As Petitioner argues, a preponderance of the evidence supports Staller teaches such a switch. Ex. 1006, Fig. 1, 5:38–43; Ex. 1003 ¶¶ 131–136; Pet. 44–45. Patent Owner does not persuasively dispute this point.

In summary, we determine that Petitioner shows by a preponderance of the evidence that claim 1 would have been obvious to one of ordinary skill in the art in view of the combination of Plassmann, Treuillet, and Staller.

c) Claim 2

Claim 2 recites “[t]he device according to claim 1 wherein the at least two distinct pre-defined positions (A3, A4) are included in a space region corresponding to a depth of field (6) of the double-optics (2).” Ex. 1001, 11:58–61. As Petitioner argues, the preponderance of the evidence supports that a person having ordinary skill in the art would have reason to ensure that each predefined position falls within Plassmann’s depth of field to obtain focused images. Ex. 1003 ¶¶ 145–146; Pet. 47. Patent Owner does not persuasively dispute this point.

d) Claim 3

Claim 3 recites “[t]he device according to claim 1 wherein the closer point position (A4) and the farther point position (A3) are such that a surface of a field of view corresponding to the farthest point position (A3) is at least 25% larger than a surface of a field of view corresponding to the closer point position (A4).” Ex. 1001, 11:62–67. To address this recitation, Petitioner

argues that it would have been obvious to a person having ordinary skill in the art to define a farther position 25% larger than the closer position. Pet. 49. Petitioner persuasively argues that Plassmann and Treuillet both disclose that Plassmann could be used for wound monitoring. *Id.* Petitioner also persuasively argues that a person of ordinary skill in the art would have understood that wound-monitoring devices could employ close and far positions which differ in magnification by more than 200%. *Id.* A preponderance of the evidence including the Clark reference evidences this point. Ex. 1017; Ex. 1003 ¶ 153.

Petitioner further argues a person having ordinary skill in the art would have also understood that a Plassmann-type stereophotogrammetry device could be used for imaging face or breasts. Pet. 50. A preponderance of the evidence also supports this position. The '119 patent acknowledges that stereophotogrammetry devices had been used for 3D reconstructions of face and breasts in A3 and A4 surface format. Ex. 1001, 1:41–48; Ex. 1003 ¶¶ 154–155. Note, however, that the '119 patent states that specialists use “two distinct stereophotogrammetry cameras” for acquiring 3D representation of faces or breasts. Ex. 1001, 1:49–52.

Petitioner's witness, Dr. Otto, calculates that Plassmann's 30-centimeter depth of field would be sufficient to encompass a “surface field of view” equivalent to the A4 format and equivalent to the A3 format (different by more than 25%). Pet. 50–51 (citing Ex. 1003 ¶¶ 156–157). Dr. Otto also testifies that, while Plassmann and Treuillet do not disclose focal length of the Plassmann device's lenses, a person having ordinary skill in the art would understand that different lenses could be employed to achieve different results. Pet. 51 (citing Ex. 1003 ¶¶ 158–166). Dr. Otto further explains that a person of ordinary skill could configure a Plassmann

device to take both A3 and A4 formats within the depth of field of the Plassmann device. *Id.* Dr. Otto further explains that a person of ordinary skill would understand that any suitable lens could be used to achieve imaging goals. *Id.* at 51–52, 54 (citing Ex. 1003 ¶¶ 167, 172–173).

Petitioner further argues that a person having ordinary skill in the art would have known that similar stereophotogrammetry devices could image face and bodies, such as the LifeViz II device. Pet. 52–53; Ex. 1014, 2 (depicting images of faces and breasts using LifeViz II); Ex. 1003 ¶ 168. Petitioner argues that Hoefflin teaches that LifeViz II has a depth of field from 80–120 cm and that a person of ordinary skill in the art would have thus understood that a 40-centimeter depth of field would be sufficient to encompass A4 format and 100% larger A3 format. Pet. 53 (citing Ex. 1003 ¶¶ 169–170; Ex. 1015, 8–9). Dr. Otto confirmed that such a device could encompass these formats. *Id.* (citing Ex. 1003 ¶ 171).

Patent Owner argues that Dr. Otto’s analysis and conclusions are flawed. PO Resp. 46. Patent Owner argues, as Petitioner acknowledged, that neither Plassmann nor Treuillet disclose actual focal length of the lenses, and Patent Owner argues that this means neither references teaches “field of view.” *Id.* (citing Ex. 2013 ¶¶ 102–193; Ex. 1003 ¶ 158). Patent Owner, thus, emphasizes that Dr. Otto relies on replacing Plassmann’s lenses to reach A4 and A3 formats. *Id.* at 47.

Patent Owner then argues that Dr. Otto’s calculations and approach err because they are based on a single pyramidal view rather than considering, as is necessary for stereophotogrammetry, the intersection of two separate view frustums. *Id.* at 48. Patent Owner’s witness, Dr. van der Weide, explains this error. Ex. 2013 ¶¶ 196–199. Patent Owner further argues that depth of field is controlled by lens aperture and that Dr. Otto

could not evaluate Plassmann's depth of field without lens aperture dimensions. PO Resp. 49–50 (citing Ex. 2013 ¶ 200).

Patent Owner also argues that, even under Dr. Otto's calculations, the subject would have to be imaged 64.5 cm from the camera which is outside of the 65–95 cm depth of field Dr. Otto calculates. *Id.* at 50 (citing Ex. 1003 ¶ 157; Ex. 2013 ¶ 201).

Patent Owner also disputes that Petitioner and Dr. Otto incorrectly contend that LifeViz II could image the face and torso. Patent Owner emphasizes that the face image is from a QuantifiCare advertisement while the torso image is from Hoefflin, which used a different camera. *Id.* at 51–53 (citing Ex. 1014, 1–2; Ex. 1015, 2, 3, 4); Ex. 2013 ¶¶ 204–205; Ex. 2019 ¶¶ 20, 23–24). Patent Owner further argues that Hoefflin only provides focal length rather than depth of field. PO Resp. 53 (citing Ex. 1005, 8–9; Ex. 1015, 4; Ex. 2013 ¶ 296). Patent Owner also argues that Polaroid's Macro SLR 3 and 5 used different lenses with different focus distances to achieve different magnification. *Id.* at 53–54 (citing Ex. 2013 ¶¶ 207–208).

Patent Owner then argues that, because of Dr. Otto's analytic errors, Petitioner has not shown that modified devices would meet claim 3 or that a person having ordinary skill in the art could determine how to modify the devices with a reasonable expectation of success. PO Resp. 54.

Considering all of the evidence before us, the preponderance of the evidence supports that a person having ordinary skill in the art would have had reason to configure Plassmann as claim 3 recites (to be able to take both face and breast stereo-photos) and would have understood that suitable lenses and focus distance could be employed to achieve claim 3's field of view. We find Dr. Otto's testimony credible and Petitioner's position persuasive based on the evidence the Petition cites.

In particular, the preponderance of the evidence suggests that a person of skill in the art would have known the benefit of creating stereophotogrammetric 3-D images of both faces and breasts. *See* Ex. 1001, 1:41–48 (admitting known desire to create images of faces and breasts); Ex. 1014, 2 (suggesting that LifeViz device can create 3-D face image); Ex. 1015, 3 (suggesting LifeViz device can create 3-D breast images). The preponderance of the evidence further supports that a person having ordinary skill in the art would have known that the device described by Plassmann and Treuillet could be configured to create these images with a reasonable expectation of success by making use of various lenses, focal lengths, depth of field, and so forth to define closer and farther imaging positions as desired and, in particular, to reach the recitations of claim 3 for face and breast imaging. Pet. 54; Ex. 1003 ¶ 172; Ex. 1053 ¶¶ 69–74.

Patent Owner’s arguments that Petitioner’s witness, Dr. Otto, miscalculates the precise adjustments that would allow such imaging (PO Resp. 46–53) do not undermine Petitioner’s rationale as to why a person having ordinary skill in the art would combine the references’ teachings to reach claim 3 or would have reasonable expectation of success reaching claim 3. As Petitioner points out, Patent Owner lacks evidence that would undermine Petitioner’s position that such a device would have been desired and achieving such a device would have been within ordinary skill in the art. Reply 21. Thus, the preponderance of evidence as to this more general proposition remains true even if Patent Owner were correct that Dr. Otto’s precise calculations were in error. Petitioner does not have a burden to provide precise dimensions of an obvious device within the scope of claim 3. Rather, Petitioner needs to show that a person having ordinary skill in the art would have had both a reason to combine and reasonable expectation of

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success as to reaching claim 3's recitations. As we explain above, Petitioner meets this burden.

In sum, we find that Petitioner demonstrates by a preponderance of the evidence that claim 10 would have been obvious to one of ordinary skill in the art over Plassmann, Treuillet, and Staller.

e) Claim 4

Claim 4 recites:

The device according to claim 3 wherein the field of view corresponding to the closer point position (A4) is equal to a normalized surface format A4, that is 21 cm times 29.7 cm, with possible variations of plus or minus 40% of a surface of the normalized surface format A4 and the field of view corresponding to the farther point position (A3) is equal to a normalized surface format A3, that is 29.7 cm times 42 cm, with possible variation of plus or minus 40% of a surface of the normalized surface format A3.

Ex. 1001, 12:1–9. For largely the same reasons as claim 3, Petitioner argues that it would have been obvious to a person having ordinary skill in the art to select a field of view that corresponds to A3 surface format and a second field that corresponds to A4. Pet. 54–55. Patent Owner argues that Petitioner does not meet its burden for the same reasons as claim 3. PO Resp. 54–55. As we explain above, the preponderance of the evidence supports Petitioner's position. *See also* Ex. 1003 ¶¶ 176–178 (Dr. Otto addressing claim 4).

f) Claim 8

Claim 8 first recites “[a] method comprising using the stereophotogrammetry device according to claim 1 comprising.” Ex. 1001, 12:31–32. As explained above, the combined teachings of Plassmann, Treuillet, and Staller disclose each recitation of claim 1. As explained below,

Petitioner also adequately establishes that the references disclose all steps of the method of using the claim 1 device. Pet. 56.

Claim 8 next recites “activating the switch (5) of the positioning system (34) to select one out of the at least two distinct point positions (100).” Ex. 1001, 12:33–35. As we explain above and as Petitioner argues, the preponderance of the evidence supports that Staller discloses such a switch. A person of ordinary skill in the art would also understand that Staller suggests activating the switch. Pet. 56; Ex. 1003 ¶ 182. Patent Owner does not persuasively dispute this point.

Claim 8 next recites “switching on the first pair of light beamers (3*b*, 3*c*) if the first selection position configured to select the farther point position (A3) is selected or switching on the second pair of light beamers (4*b*, 4*c*) if the second selection position configured to select the closer point position (A4) is selected.” Ex. 1001, 12:42–44. As we explain above and as Petitioner argues, the preponderance of the evidence supports that Staller discloses such a switch. A person of ordinary skill in the art would also understand that Staller suggests activating the switch. Pet. 56; Ex. 1003 ¶ 184. Patent Owner does not persuasively dispute this point.

Claim 8 next recites “moving the stereophotogrammetry device and/or the target subject (S) so that the target subject (S) is at that selected pre-defined point position (200).” Ex. 1001, 12:42–44. As explained above and as Petitioner argues, the preponderance of the evidence supports that Plassmann and Treuillet disclose a positioning system configured to allow the device “to be relocated at the same repeatable distance from a subject as demonstrated in FIG. 4.” Ex. 1006, 5:19–21; Pet. 57; *see also* Ex. 1003 ¶¶ 186–188. Patent Owner does not persuasively dispute this point.

Claim 8 next recites “taking one or several stereo-pairs at that selected

predefined point position (300).” Ex. 1001, 12:45–46. As explained above and as Petitioner argues, the preponderance of the evidence supports that Plassmann teaches taking a stereo-pair at the selected point position. Pet. 57–58; Ex. 1007, 12:9–26; Ex. 1003 ¶¶ 189–190. Patent Owner does not persuasively dispute this point.

In summary, Petitioner adequately establishes that the cited art teaches each recitation of each claim subject to this ground, and Petitioner adequately establishes reason to combine the references teachings to reach each claim subject to this ground. Thus, after fully considering the entire record including the weight of the evidence as to the cited references teaching each recitation of claims 1–4 and 8, the weight of the evidence supporting reason to combine the cited references with reasonable expectation of success, and the weight of evidence supporting objective indicia of non-obviousness, we conclude that Petitioner persuasively establishes by a preponderance of the evidence that the subject matter of claims 1–4 and 8 would have been obvious in view of Plassmann, Treuillet, and Staller.

F. Ground Two: Obviousness Based on Plassmann, Treuillet, Staller, and Peng

Petitioner asserts that the ’119 patent’s claims 9–11 would have been obvious over Plassmann, Treuillet, Staller, and Peng. We provide an overview of Peng before we address this ground.

1. Peng (Ex. 1009)

Peng is a paper that relates to an “automatic 3D reconstruction method” to reconstruct a 3D scene using “complementary stereo information from four cameras.” Ex. 1009, 1. In particular, Peng’s “3D model

reconstruction system us[es] images acquired from multiple stereo pairs.” *Id.* at 2. Peng explains that a “normal camera” has a “limited field-of-view.” *Id.* at 6. Accordingly, Peng describes a process to “reconstruct a large and integrated scene” by “finding more than three spatial matched points between different 3D models [and] can achieve 3D model stitching.” *Id.*; *see id.* at 2–3.

2. Discussion

Because Petitioner’s ground requires combining the teachings of Plassmann, Treuillet, Staller, and Peng (Pet. 5), we first address motivation to combine. *See KSR Int’l Co.*, 550 U.S. 398 at 418. We then address the recitations of each claim that this ground addresses.

a) Reason to combine

Petitioner argues that a person of ordinary skill in the art would have had reason to combine the disclosures of Plassmann, Treuillet, and Staller for the reasons we address above. Pet. 66. Petitioner argues that a person of ordinary skill in the art would have had reason to combine Peng’s teachings with the combined disclosures of Plassmann, Treuillet, and Staller because Peng relates to reconstruction of comprehensive 3-Dimensional representations. *Id.* Petitioner emphasizes that the ’119 patent admits that techniques of matching and stitching images were already known to persons of ordinary skill in the art. *Id.* (citing Ex. 1001, 2:6–39; Ex. 1003 ¶ 216). Petitioner argues that a person of ordinary skill in the art would recognize that Peng’s disclosures regarding reconstruction of 3-D images would be useful in the context of Plassmann, Treuillet, and Staller because they relate to providing stereophotogrammetry images of the face and torso of a subject as Peng discloses. *Id.* Petitioner argues that a person of ordinary skill in the art would expect success because such 3-D image reconstruction was known

in the art and because the '119 patent does not specify how such reconstruction should be performed. *Id.* at 67. A preponderance of the evidence supports Petitioner's position regarding reason to combine with reasonable expectation of success. Ex. 1001, 2:6–39, 7:20–27, 10:31–37; Ex. 1003 ¶¶ 216–219. Patent Owner does not persuasively dispute this position. PO Resp. 66–67.

a) Claim 9

Claim 9 first recites “[t]he method according to claim 8 comprising taking several stereo-pairs at the selected pre-defined point position and.” Ex. 1001, 12:47–49. Petitioner argues that the '119 patent and prior art acknowledge that a person of ordinary skill in the art would have understood that more than one stereo-pairs is necessary to create a 3-D construction of certain curved surfaces. Pet. 59–60. Petitioner further argues that Hoefflin teaches stitching five views together. *Id.* Thus, Petitioner argues that the combination of references discloses this element. The preponderance of the evidence supports Petitioner's position. Ex. 1001, 1:65–2:5, 2:6–15; Ex. 1003 ¶¶ 193–196; Ex. 1015, 2. Patent Owner does not persuasively dispute this point.

Claim 9 next recites “reconstructing 3-Dimensional surfaces of the target subject (S) corresponding to each of the stereo-pairs (400); and.” Ex. 1001, 12:50–52. Petitioner argues that reconstructing 3-Dimensional purposes is the primary purpose of stereophotogrammetry for image pairs and a person of ordinary skill in the art would have been well acquainted with techniques for such reconstruction. Pet. 60–64. The preponderance of the evidence including, for example, disclosures of Treuillet and Peng, supports Petitioner's position. Ex. 1003 ¶¶ 197–211; Ex. 1009, 6; Ex. 1016, 755, 756. Patent Owner does not persuasively dispute this point.

Claim 9 next recites “matching the different 3-Dimensional surfaces in space (500); and.” Ex. 1001, 12:53–54. As Petitioner argues, the preponderance of the evidence supports that Peng supports such matching to achieve reconstruction as referenced in Plassmann and Treuillet. Pet. 64; Ex. 1003 ¶¶ 210–212; Ex. 1009, 1–2, 6. Patent Owner does not persuasively dispute this point.

Claim 9 next recites “stitching together the different surface pieces of the target subject (S) into a comprehensive 3-Dimensional representation (600).” Ex. 1001, 12:55–57. As Petitioner argues, the preponderance of the evidence supports that Peng teaches such stitching. Pet. 65–66; Ex. 1003 ¶¶ 213–215; Ex. 1009, Figs. 9(b), 2, 7, 8. Patent Owner does not persuasively dispute this point.

b) Claim 10

Claim 10 recites “[t]he method according to claim 9 comprising using a computer program product stored on a non-transitory media to operate the steps of reconstructing, matching, and stitching.” Ex. 1001, 12:58–61. As Petitioner argues, Plassmann and Treuillet suggest using a computer executing software to accomplish the recited steps. Pet. 67–68; Ex. 1003 ¶¶ 220–222; Ex. 1007, 12:25–29; Ex. 1009, 2–6; Ex. 1016, 754–758. Patent Owner does not persuasively dispute this point.

c) Claim 11

Claim 11 first recites “[t]he method according to claim 8 comprising selecting (100): Either the closer point position (A4) and then placing a face of the target subject (S) at the closer point position.” Ex. 1001, 12:62–65. As Petitioner persuasively argues, the preponderance of the evidence supports that the cited references teach this recitation. Pet. 68; Ex. 1003 ¶ 223. Patent Owner does not persuasively dispute this point.

Claim 11 next recites “and then taking several stereo-pairs of the face of the target subject (S) at the closer point position, processing these stereo-pairs to reconstruct 3-Dimensional surfaces of the face of the target subject (S), then matching these different 3-Dimensional surfaces in space and finally stitching together these different 3-Dimensional surfaces into a comprehensive 3-Dimensional surface representation (710) of the face of the target subject (S); or.” Ex. 1001, 12:66–13:7. As Petitioner argues, the cited references teach this recitation. Pet. 69; Ex. 1003 ¶ 224.

Claim 11 next recites

the farther point position (A3) and then placing a torso of the target subject (S) at the farther point position, and then taking several stereo-pairs of the torso of the target subject (S) at the farther point position, processing these stereo-pairs to reconstruct 3-Dimensional surfaces of the torso of the target subject (S), then matching these different 3-Dimensional surfaces in space and finally stitching together these different 3-Dimensional surfaces into a comprehensive 3-Dimensional surface representation (720) of the torso of the target subject (S).

Ex. 1001, 13:8–18.

As Petitioner persuasively argues, the cited references disclose the step of taking several stereo-pairs of the torso, when the closer position is selected, and matching and stitching resulting 3-dimensional surfaces in space to produce a comprehensive 3-D surface representation thereof. Pet. 69–70; Ex. 1003 ¶ 226.

Patent Owner argues that the Petition does not substantively discuss why claim 11 is obvious and, instead, incorrectly refers back to its explanation of claims 3 and 4. PO Resp. 68–69. In particular, Patent Owner argues that, as to claims 3 and 4, Petitioner fails to establish that it would have been obvious to create a device capable of imaging both the face and

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torso. *Id.* We disagree. Petitioner meets its burden as to claim 11 for substantially the same reasons we explain above as to claims 3 and 4.

In summary, Petitioner adequately establishes that the cited art teaches each recitation of each claim subject to this ground, and Petitioner adequately establishes reason to combine the references teachings to reach each claim subject to this ground. Thus, after fully considering the entire record including the weight of the evidence as to the cited references teaching each recitation of claims 9–11, the weight of the evidence supporting reason to combine the cited references with reasonable expectation of success, and the weight of evidence supporting objective indicia of non-obviousness, we conclude that Petitioner persuasively establishes by a preponderance of the evidence that the subject matter of claims 9–11 would have been obvious in view of Plassmann, Treuillet, Staller, and Peng.

G. Legal Sufficiency of the Petition

Patent Owner argues that the Petition is legally deficient because first, in related District Court litigation, Petitioner alleged that various claim recitations of claims 9 and 11 should be construed under Section 112(f) and, second, Petitioner violated 37 C.F.R. § 42.104(b) by not identifying how these recitations should be construed and by not identifying corresponding portions of the specification. PO Resp. 67–69.

Patent Owner’s arguments are unpersuasive. In this *inter partes* review, Petitioner argues that express construction is not necessary for any claim term. Pet. 17. This is sufficient under our Rules. *See* CTPG 44 (“[A] petitioner may include a statement that the claim terms require no express construction.”). Patent Owner does not identify any requirement that Petitioner must take a claim construction position in this proceeding that is

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identical to a position taken in a still pending district court litigation. An inconsistency, however, can weigh against an argument on how to construe a claim term. Here, however, Patent Owner does not argue that Section 112(f) actually should apply to any claim term.

In addition, we do not find persuasive Patent Owner's reliance on *Orthopediatrics Corp. v. K2M, Inc.*, IPR2018-01548, Paper 9, at 9–12 (PTAB Mar. 1, 2019). PO Resp. 67–68. This Board decision is non-precedential and we find that under the facts here. For example, in *Orthopediatrics Corp.*, the construction of the term was in dispute, which is not the situation here as neither party argues Section 112(f) applies. Paper 9, at 9. And the petitioner in *Orthopediatrics Corp.* argued, *inter alia*, that its “petition is based on the claim constructions urged by Patent Owner in the related district court litigation,” but failed to “set forth Patent Owner's position in the related [d]istrict [c]ourt litigation.” *Id.* at 9–10.

In sum, we do not find that the Petition in this proceeding is insufficient under 37 C.F.R. § 42.104(b).

VI. CONCLUSION²¹

For the above reasons, we determine that Petitioner establishes, by a preponderance of the evidence, that

²¹ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. §§ 42.8(a)(3), (b)(2).

(a) claims 1–4 and 8 of U.S. Patent No. 10,070,119 B2 are unpatentable under 35 U.S.C. § 103 as obvious over the combination of Plassmann, Treuillet, and Staller; and

(b) claims 9–11 of U.S. Patent No. 10,070,119 B2 are unpatentable under 35 U.S.C. § 103 as obvious over the combination of Plassmann, Treuillet, Staller, and Peng.

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–4, 8	103	Plassmann, Treuillet, Staller	1–4, 8	
9–11	103	Plassmann, Treuillet, Staller, Peng	9–11	
Overall Outcome			1–4, 8–11	

VII. ORDER

In consideration of the foregoing, it is hereby

ORDERED that Petitioner establishes by a preponderance of the evidence that claims 1–4 and 8–11 of U.S. Patent No. 10,070,119 B2 are unpatentable;

FURTHER ORDERED that Patent Owner’s Motion to Exclude is *denied* with respect to evidence addressed by § III.A, *supra*, and is *dismissed as moot* with respect to evidence addressed by § III.B, *supra*;

FURTHER ORDERED that Patent Owner’s Objections to Petitioner’s Demonstratives are *overruled*; and

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FURTHER ORDERED that, because this is a Final Written Decision, the parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

Case: 23-1917 Document: 25 Page: 528 Filed: 03/19/2024
Case: 23-1918 Document: 13 Page: 80 Filed: 06/29/2023

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Case: 23-1918 Document: 13 Page: 81 Filed: 06/29/2023

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CANFIELD SCIENTIFIC, INC.,
Petitioner,

v.

QUANTIFICARE S.A.,
Patent Owner.

IPR2021-01518
Patent 10,165,253 B2

Before BRIAN J. MCNAMARA, JOHN D. HAMANN, and
BRIAN D. RANGE, *Administrative Patent Judges*.

HAMANN, *Administrative Patent Judge*.

JUDGMENT

Final Written Decision

Determining All Challenged Claims Unpatentable

Denying In Part and Dismissing In Part Patent Owner's Motion to Exclude

35 U.S.C. § 318(a)

I. INTRODUCTION

In this *inter partes* review, instituted pursuant to 35 U.S.C. § 314, Canfield Scientific, Inc. (“Petitioner”) challenges the patentability of claims 1–4, 8–12, 15, 16, and 20–23 (“the challenged claims”) of U.S. Patent No. 10,165,253 B2 (Ex. 1020, “the ’253 patent”), owned by QuantifiCare S.A. (“Patent Owner”). We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a) (2018) and 37 C.F.R. § 42.73 (2022). For the reasons discussed herein, we determine that Petitioner shows by a preponderance of the evidence that the challenged are unpatentable.

A. Procedural History

Petitioner filed a Petition requesting *inter partes* review of the challenged claims of the ’253 patent. Paper 1 (“Pet.”). Patent Owner filed a Preliminary Response. Paper 7. With our authorization, Petitioner filed a Preliminary Reply (Paper 14) to the Preliminary Response relating to claim construction, and Patent Owner filed a Preliminary Sur-reply (Paper 15) in response to the Preliminary Reply.

We instituted *inter partes* review of all of the challenged claims of the ’253 patent on all of the grounds raised in the Petition. Paper 16 (“Dec. on Inst.”), 31. Patent Owner filed a Response to the Petition. Paper 21 (“PO Resp.”). Petitioner filed a Reply to Patent Owner’s Response. Paper 30 (“Pet. Reply”). Patent Owner filed a Sur-reply to Petitioner’s Reply. Paper 42 (“PO Sur-reply”).

Patent Owner filed a Motion to Exclude certain of Petitioner’s evidence (Paper 46, “Mot. Excl.”) and Petitioner filed an Opposition. Paper 47 (“Opp. Mot. Excl.”). Patent Owner filed a Reply in support of its Motion. Paper 53 (“Reply Mot. Excl.”).

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Patent Owner filed objections to Petitioner's demonstratives. Paper 58 ("PO Objs."). Patent Owner alleges, *inter alia*, that certain of Petitioner's slides contain new argument. *See generally id.*

An oral hearing was held on December 14, 2022. A transcript of the oral hearing is included in the record. Paper 60 ("Tr.).

B. Real Parties-in-Interest

The parties identify themselves as the real parties-in-interest. Pet. 2; Paper 4, 1.

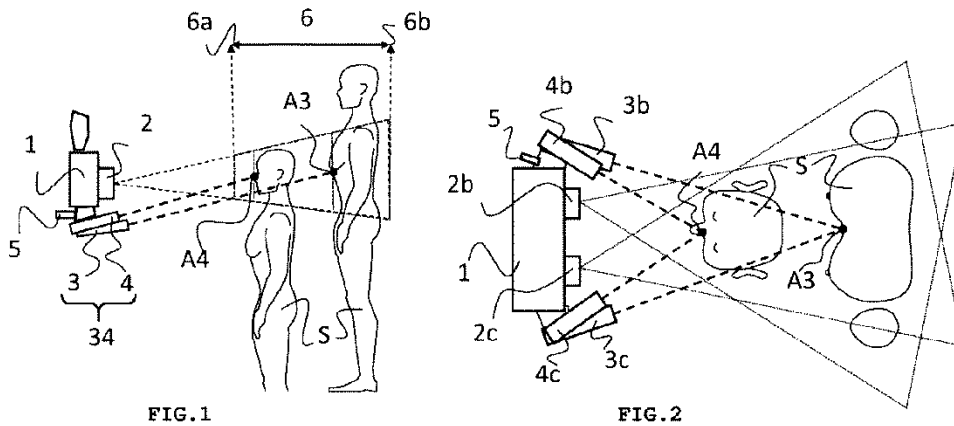
C. Related Matters

The parties identify the following as a related matter: *QuantifiCare, Inc. v. Canfield Scientific, Inc.*, C.A. No. 1:20-cv-12305 (D.N.J.). Pet. 3; Paper 4, 1. In addition, Petitioner has filed petitions for *inter partes* review of two additional patents related to the '253 patent, that also are owned by Patent Owner: (i) U.S. Patent No. 10,070,119 B2 ("the '119 patent") (IPR2021-01511) and (ii) U.S. Patent No. 10,681,334 B2 (IPR2021-01519).

D. The Challenged Patent

The '253 patent is titled "Device and Method to Reconstruct Face and Body in 3D." Ex. 1020, code 54. The '253 patent relates to a stereophotogrammetry device used "to picture and reconstruct in 3D the surface of objects of different sizes," e.g., different body parts such as the face and the torso. *Id.* at 3:27–30; *see id.* at 1:13–21, 1:48–55. By way of background, the '253 patent explains that "[s]tereophotogrammetry consists in [simultaneously] gathering the images of a subject from at least two view with a calibrated camera," i.e., a "stereo-pair." *Id.* at 1:31–36. The stereo-pair is used to "reconstruct . . . a dense representation in 3-Dimensions of the surface of the observed object." *Id.* at 1:37–39.

Figures 1 and 2, reproduced below, respectively show side- and top-views of an “implementation” of a stereophotogrammetry device and its components. *Id.* at 3:53–56.



Figures 1 represents a possible implementation of the '253 patent's device as viewed from the side, and Figure 2 represents a possible implementation of the device as viewed from the top. *Id.* As shown in Figures 1 and 2, camera body (1) includes double optics (2). *Id.* at 8:34–35. As shown in Figure 2, double optics (2) are “composed of two sub-optics (2b) and (2c), enabling the acquisition of a stereo[-]pair [of images] corresponding to two slightly different viewing angles” simultaneously. *Id.* at 8:35–38; *see id.* at 3:39–42. In addition, Figure 8 shows a series of stereo-pair images taken at different angles for a face. *Id.* at 11:12–19.

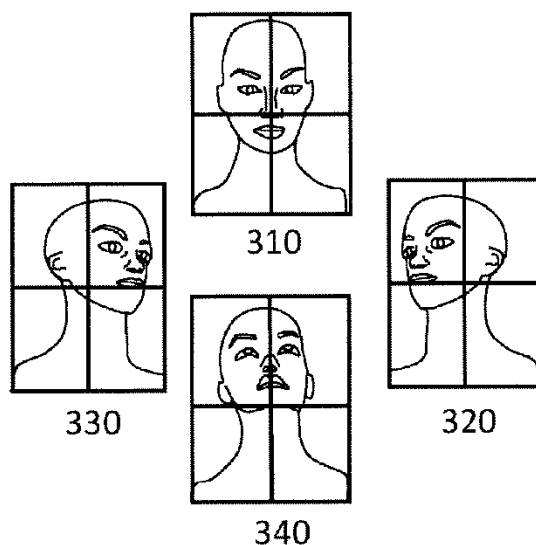


FIG. 8

The '253 patent specification describes Figure 8 as presenting “viewpoints optimized for imaging a face using a field of view close to an A4 surface format.” *Id.* at 4:4–5. Using the captured stereo-pairs, “a comprehensive representation in 3D of the surface of the subject (S)” can be constructed. *Id.* at 10:37–48.

Further, the stereophotogrammetry device captures stereo-pairs of images at “two distinct distances for picture taking corresponding respectively to position (A3) and (A4)” such that the stereo-pairs of images are in focus at positions A3 and A4, which are within the device’s depth of field 6. *Id.* at 8:40–50; *see id.* at 6:23–26. For example, position A3 is used for capturing images of the torso while position A4 is used for capturing images of the face. *Id.* at 6:14–16; *see id.* at 1:51–59. Positions A3 and A4 can be identified by the convergence of respective light patterns projected onto the subject to be imaged, the respective light patterns converging at the distances for positions A3 and A4. *Id.* at 4:51–5:5. For example, as shown

in Figure 2, a light pattern emitted by first pair of light beamers (3b) and (3c) converge at point (A3) and a different light pattern emitted by second pair of light beamers (4b) and (4c) converge at point (A4). *Id.* at 8:51–55; *see id.* at 4:61–64. Accordingly, “by placing the subject so that the light patterns projected by a first pair of beamers are superposed on the surface of the subject[,] one is placing the subject at” the first predefined position (and similarly for the light pattern emitted by the second pair of beamers converging at the second position). *Id.* at 4:57–61; *see id.* at 5:14–35.

E. Challenged Claims

Petitioner challenges claims 1–4, 8–12, 15, 16, and 20–23 of the ’253 patent. Pet. 5. Claim 1 is the only challenged independent claim. Claim 1 is illustrative of the challenged claims, and reads as follows:

1. A device for stereophotogrammetry comprising a camera body (1) and a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views according to two different angles, wherein the device is comprising a positioning system (34) configured to signal when a target subject (S) is reaching a pre-defined distance position to the camera (1) corresponding to one of at least two distinct pre-defined distance positions (A3, A4) of the target subject (S) relative to the camera body (1) of the stereophotogrammetry device, the at least two distinct predefined distance positions comprising a closer distance position (A4) and a farther distance position (A3), the closer distance position (A4) being closer to the camera body (1) of the stereophotogrammetry device than the farther distance position (A3) to the camera body (1) of the stereophotogrammetry device.

Ex. 1020, 11:42–57.

F. Instituted Grounds of Unpatentability

We instituted trial based on the following grounds of unpatentability, which are all the grounds of unpatentability raised in the Petition:

Claim(s) Challenged	35 U.S.C. § ¹	Reference(s)/Basis
1–4, 8–11, 15, 16, 20	103	Plassmann, ² Treuillet, ³ Staller ⁴
12	103	Plassmann, Treuillet, Staller, Kingslake ⁵
21–23	103	Plassmann, Treuillet, Staller, Peng ⁶

Pet. 5, 28–81. Petitioner submits in support of its arguments the Declaration of Gerhardt Paul Otto, Ph.D. (Ex. 1003) and the Supplemental Declaration of Gerhardt Paul Otto, Ph.D. (Ex. 1053). Patent Owner submits in support of its arguments the Declaration of Dr. Daniel van der Weide (Ex. 2006), the Second Declaration of Dr. Daniel van der Weide (Ex. 2013), and the Declaration of Dr. Jean-Philippe Thirion (Ex. 2019).

II. LEVEL OF ORDINARY SKILL IN THE ART

To determine whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). In assessing the level of ordinary skill in the art, various factors

¹ The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. § 103 that became effective on March 16, 2013. Because the ’253 patent issued from an application having an effective filing date after March 16, 2013, we apply the AIA version of the statutory basis for unpatentability.

² WO 2010/097572 A2, published Sept. 2, 2010 (Ex. 1007).

³ Sylvie Treuillet, et al., *Three-Dimensional Assessment of Skin Wounds Using a Standard Digital Camera*, IEEE Transactions on Medical Imaging, Vol. 28, No. 5 at 752 (2009) (Ex. 1016).

⁴ US 7,257,322 B2, issued Aug. 14, 2007 (Ex. 1006).

⁵ Rudolf Kingslake, *A History of the Photographic Lens*, Academic Press Inc. (1989), (selected portions filed as Ex. 1028).

⁶ Qi Peng et al., *Automated 3D Scenes Reconstruction Using Multiple Stereo Pairs from Portable Four-Camera Photographic Measurement System*, International Journal of Optics, Vol. 2015 (2015) (Ex. 1009).

may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citing *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962–63 (Fed. Cir. 1986)). “[O]ne or more factors may predominate.” *Id.*

Petitioner argues that one of ordinary skill in the art “would have had a working understanding of photography, stereophotogrammetry, and distance measuring in photography or stereophotogrammetry, a master’s degree with a scientific focus on subjects such as optics and/or image processing, with at least about three years of experience in the field of photography, and stereophotogrammetry, as well as image processing in these fields, or an equivalent qualification.” Pet. 15 (citing Ex. 1003 ¶¶ 17–20).

Patent Owner argues that one of ordinary skill in the art “would have a Bachelor’s degree in Physics or Electrical Engineering or a similar field and two to three years of experience, including in image processing and computer graphics.” PO Resp. 23 (citing Ex. 2013 ¶¶ 30–32). Patent Owner adds that “Petitioner’s assertion of a higher level . . . is incorrect.” *Id.*

The parties do not substantively address the differences in their proposed definitions for one of ordinary skill in the art. Pet. Reply. 8; PO Resp. 23; *see generally* PO Sur-reply. Moreover, the parties agree that which definition we adopt does not substantively impact our analysis of the parties’ arguments concerning unpatentability. Tr. 29:19–30:9, 75:20–25.

Because Patent Owner’s definition of the level of skill in the art is consistent with the ’253 patent and the asserted prior art, we adopt it for purposes of this Final Written Decision. *See Okajima v. Bourdeau*, 261 F.3d

1350, 1355 (Fed. Cir. 2001); *GPAC*, 57 F.3d at 1579; *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978). In addition, we do not find sufficient support in the record for requiring one of ordinary skill in the art to have had a master's degree. Compare Ex. 1003 ¶ 20 (requiring a master's degree), with Ex. 2013 ¶ 31 (testifying why a master's degree was unnecessary). Our analysis herein, however, does not turn on which of the parties' definitions we adopt.

III. CLAIM CONSTRUCTION

Because the Petition was filed after November 13, 2018, we apply the same claim construction standard that would be used in a civil action under 35 U.S.C. § 282(b), following the standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b); 83 Fed. Reg. 51,340, 51,340–41, 51,343 (Oct. 11, 2018). In applying such standard, claim terms are generally given their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art, at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

Petitioner states that it “does not believe express constructions are required for any terms.” Pet. 16 (citing Ex. 1003 ¶ 62); Tr. 28:13–16 (Petitioner agreeing that the claim terms have their plain and ordinary meaning); Pet. Reply 1. Patent Owner likewise argues that the claim terms should have their plain and ordinary meaning. PO Sur-reply 1.

However, the parties dispute the scope of the plain and ordinary meaning of “two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views according to two different angles,” as recited in claim 1. PO Resp. 1–23; Pet. Reply 1–8; PO Sur-reply 1–9. Thus, we address the parties’ arguments to resolve this dispute. *See Eon Corp. IP Holdings v. Silver Spring Networks*, 815 F.3d 1314, 1318 (Fed. Cir. 2016) (finding that disputes between the parties over the plain and ordinary meaning of a term should be resolved as a matter of claim construction).

The gravamen of the parties’ dispute is what “different angles” refers to in the context of this limitation. According to Patent Owner, “different angles” refers to the orientation of the optical axis of each sub-optic. *E.g.*, PO Resp. 5–7. Specifically, Patent Owner argues that the limitation excludes configurations where the sub-optics’ optical axes are in parallel because the two views would be acquired at the same angle. *E.g.*, *id.* In contrast, Petitioner argues that “different angles” refers to the sub-optics viewing a *subject* from different angles, such as when the sub-optics are spaced apart—parallel configurations are not excluded. *E.g.*, Pet. Reply 1.

We address in detail the parties’ arguments below, starting with the intrinsic evidence.

A. Claim Language

Patent Owner argues that the language of the claims “does not mention light ‘from the subject’ or ‘object to be imaged,’ much less angles at which light is received from different points on a subject/object.” PO Resp. 19 (citing Ex. 2013 ¶ 101). “Rather, the ‘two different angles’ limitation defines an intrinsic characteristic of the sub-optics, *i.e.*, how they are ‘configured’” or angled, according to Patent Owner. *Id.* (citing Ex. 2013 ¶ 100).

We disagree with Patent Owner. Rather, we conclude that the claim language does not mean that the sub-optics' optical axes are angled, but instead means that the sub-optics each view a subject from a different angle, as Petitioner argues. Ex. 1020, 11:43–45; Pet. Reply 7. Specifically, this limitation recites that the two sub-optics are “configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1020, 11:43–45. Notably, “according to two different angles” directly follows “two views,” rather than directly following “configured.” *Id.* And “view” means “[a] scene or an arrangement of subject material for a photograph,” according to a technical dictionary provided by Patent Owner. Ex. 2014,⁷ 210 (defining “view”). In other words, the term “view” itself refers to viewed subject material—a target subject.

In addition, we find unavailing Patent Owner's argument that “the ‘subject’ is claimed only in connection with the ‘positioning system (34)’ ‘configured to signal when a target subject (S) is reaching[] . . . pre-defined distance positions (A3, A4) of the target subject (S) relative to the camera body (1).” PO Resp. 19 (citing Ex. 1020, 11:46–51; Ex. 2013 ¶ 102). Again, the term “view” implicates the subject. Ex. 2014, 210.

We also find unavailing Patent Owner's argument that the claims “disclose configuring the sub-optics according to ‘two different angles’ as a prerequisite to ‘pre-defining’ the ‘positions (A3, A4) of the target subject (S),’ as further claimed, and locating the subject at such positions within the two views.” PO Resp. 19–20 (citing Ex. 2013 ¶ 103); *see also id.* at 20 (arguing that dependent claims also support this argument). This argument

⁷ Leslie Stroebel & Hollis N. Todd, *Dictionary of Contemporary Photography* (1974).

is inapposite, and does not exclude parallel sub-optics. Rather, as Patent Owner acknowledges, conventional stereophotogrammetry devices can include parallel sub-optics “configured (spaced) to acquire two views,” and provide a stereoscopic binocular area where “the parallel views intersect to form stereo-pairs that can be reconstructed into three-dimensional representations.” PO Resp. 5–6; Ex. 2013 ¶ 67; Ex. 2015,⁸ 90. Hence, positions (A3, A4) can be predefined distances for the target subject S within that stereoscopic binocular area.

We likewise find unavailing Patent Owner’s argument that “the ‘two different angles’ limitation has nothing to do with the angles at which the sub-optics receive light from a subject, but rather defines the space within which the subject must be located to be imaged in the first place.” PO Resp. 20 (citing Ex. 2013 ¶ 100); PO Sur-reply 2. This argument also is inapposite, and does not indicate that the claimed sub-optics’ axes are not in parallel, as Patent Owner argues. Rather, the space within which the subject must be located can be the stereoscopic binocular area. Ex. 2015, 90; PO Resp. 4.

We also find unavailing Patent Owner’s argument that because “[d]isplaced sub-optics may be configured to acquire two views at the same angle, or at ‘two different angles,’” “construing ‘two different angles’ to mean any displaced sub-optics would read the ‘two different angles’ limitation out of the claims.” PO Resp. 22 (citing Ex. 2013 ¶ 107); PO Sur-reply 5 (making same argument). Rather, we conclude that “according to two different angles,” in the context of the limitation, is needed to claim a stereophotogrammetry device. Put differently, we agree with Petitioner and

⁸ Richard W. Kroon, *3D A-to-Z, An Encyclopedic Dictionary* (2012).

conclude that claim 1 does not otherwise recite that the two sub-optics are spaced, such as in a conventional stereophotogrammetry device. Ex. 1020, 11:42–57; Pet. Reply 7 (citing Ex. 1053 ¶ 31).

Although the preamble for claim 1 recites “[a] device for stereophotogrammetry,” “[g]enerally, the preamble does not limit the claims.” Ex. 1020, 11:42; *Georgetown Rail Equip. Co. v. Holland L.P.*, 867 F.3d 1229, 1236 (Fed. Cir. 2017) (citation omitted). We also are persuaded by Petitioner’s argument that “the preamble here is not limiting, because the body of the claim provides a complete description of the device.” Pet. Reply 7 (citing *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997)). Hence, “two different angles” is not read out of the claims, but rather serves to claim a stereophotogrammetry device (e.g., by requiring spacing of the sub-optics).

Regardless, as Petitioner notes, no “canon of claim construction is absolute in its application and [] some surplusage may exist in some claims.” Pet. Reply 7 (quoting *Decisioning.com, Inc. v. Federated Dep’t Stores, Inc.*, 527 F.3d 1300, 1312 (Fed. Cir. 2008)). And we view the phrase “configured for a simultaneous acquisition of two views according to two different angles” as referring to a stereophotogrammetry device, regardless of whether every word is needed to convey it.

In addition, we find unavailing Patent Owner’s argument that Petitioner makes new arguments concerning viewing the subject from different angles and the preamble not being limiting. PO Sur-reply 1 & n.1. Simply put, these arguments from Petitioner involve issues related to claim construction regarding the scope of the plain and ordinary meaning of this limitation, which was raised by Patent Owner in its Response. Petitioner is allowed to respond. *See Consolidated Trial Practice Guide* (November

2019)⁹ (“CTPG”), 45 (“The petitioner may respond to any such new claim construction issues raised by the patent owner.”).

B. The '253 Patent Specification

The parties each argue that the '253 patent Specification supports their arguments for the plain and ordinary meaning of this limitation. More specifically, Patent Owner argues that Figures 2–5 support that the sub-optics are oriented to have non-parallel (i.e., inwardly angled) optical axes. *E.g.*, PO Resp. 6. Patent Owner illustrates this position by annotating Figure 2 of the '253 patent. PO Resp. 18. We reproduce Patent Owner's annotated figure below.

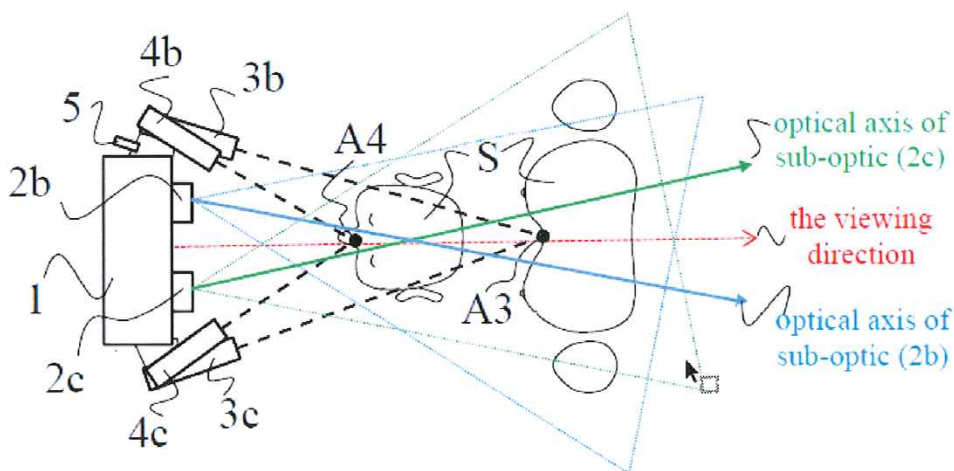


Figure 2 “represent[s] a possible implementation of the device viewed from the top.” Ex. 1020, 3:55–56. Patent Owner annotates Figure 2 by coloring the pyramid extending from sub-optic 2b blue and coloring the pyramid extending from sub-optic 2c green. PO Resp. 18. Patent Owner also adds a solid blue arrow and a solid green arrow from each sub-optic to the point where it perpendicularly bisects the respective base of each respective

⁹ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

pyramid. *Id.* Patent Owner labels each of these arrows as the “optical axis” of the respective sub-optic. *Id.* Patent Owner also adds a dotted arrow from the midpoint between the sub-optics through the centerpoint of an illustrated face and torso, and labels the arrow “the viewing direction.” *Id.*

We agree with Patent Owner that Figures 2–5 illustrate pyramid-shaped views acquired by the sub-optics where the pyramids are inwardly angled (rather than being perpendicular to the device’s plane). Ex. 1020, Figs. 2–5. The Specification indicates that all of these figures illustrate *possible* or *exemplary* implementations. *See, e.g., id.* at 3:55–59 (stating that Figures 2 and 3 each illustrate a “possible implementation”); 9:37–38 (stating that Figure 4 is an “exemplary device”); 9:45–46 (stating that Figure 5 is an “exemplary device”). Thus, the Specification does not indicate that having non-parallel optical axes for the pyramids is essential to the invention; the Specification never even uses the term “optical axis.” To the contrary, the Specification broadly provides that “[t]he double optics of the stereophotogrammetry device can be manufactured in different ways without impacting the functionality of the invention, provided that it is characterized by an increased depth of field.” *Id.* at 4:25–28.

Moreover, the Specification repeatedly refers to the different angles of the sub-optics relative to the viewed subject. *See, e.g.,* Ex. 1020, 4:14–17 (referring to “double optics enabling the acquisition of two simultaneous views with different angles *of the subject*”) (emphasis added), 4:30–33 (referring to “double optics” using “secondary mirrors each receiving one image *of the subject* with a slightly different angle”) (emphasis added); Pet. Reply 7 (citing Ex. 1053 ¶¶ 33–34).

In addition, we find unavailing Patent Owner’s arguments directed to problems identified in the Background of the Specification and the

advantages of the '253 patent. PO Resp. 10–15. For example, Patent Owner argues that the '253 patent discloses that portable stereophotogrammetry devices previously developed included “a single, nominal distance for picture taking which is optimized either for the face or for breast, but not optimized for both applications at the same time.” PO Resp. 9 (quoting Ex. 1020, 3:16–20; citing Ex. 2013 ¶ 73). Patent Owner adds that the '253 patent “ties the ‘two different angles’ limitation to overcoming the problem in the prior art and achieving the advantage of the invention” (i.e., a single stereophotogrammetry device for both distances). *Id.* at 10 (citing Ex. 1020, 3:33–36); *see also id.* (citing Ex. 1020, 4:30–33, 8:35–38; Ex. 2013 ¶ 76) (making same argument).

According to Patent Owner, however, if the sub-optics are configured for parallel views the field of view at point (A4) in Figure 2 “is too small to image the face and would not achieve the ‘advantage of the invention,’ *i.e.*, ‘a single portable stereophotogrammetry system . . . enabling the 3D reconstruction of the head . . . and . . . torso.’” PO Resp. 15 (quoting Ex. 1020, 8:19–26; citing Ex. 2013 ¶¶ 56, 87). These arguments are unavailing. Rather, we agree with Petitioner and find that “[s]imply moving the subject further from the camera would place the face” within the intersection of the parallel view pyramids. *See* Pet. Reply 4–6; Ex. 1053 ¶ 29. As can be seen for the version of Figure 2 modified by Patent Owner to show parallel view pyramids, a sufficient field of view for the face and torso is within the binocular area if the subject is moved further from the camera. *See* PO Resp. 14 (modifying Ex. 1020, Fig. 2); *see also* Ex. 1053 ¶ 29 (testifying that moving further away “[i]f no other changes were made, . . . would slightly lower the 3D resolution of the surface captured by the

device compared to using angled frustums,” “[h]owever, in this application area a slight decrease in resolution is acceptable”).

In sum, we find that the ’253 patent Specification does not limit the plain and ordinary meaning of this limitation so as to exclude sub-optics having parallel optical axes.

C. Prosecution History

We now turn to the prosecution history of the ’119 patent, which is the parent of the ’253 patent. Ex. 1020, code (63). The prosecution history “can often inform the meaning of the claim language by demonstrating how the inventor understood the invention.” *Phillips*, 415 F.3d at 1317. Such is the case here.

In particular, Patent Owner treated the “according to two different angles” language differently during prosecution than it does now. During prosecution, the Examiner rejected the challenged claims over Hoffmeier¹⁰ and concluded that Hoffmeier disclosed a stereophotogrammetry device comprising “two sub-optics (2b) and (2c) . . . configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1002 (’119 patent File History), 63–66; Ex. 1053 ¶ 12; Pet. Reply 1–3. Hoffmeier’s Figure 3 depicts its device and illustrates two views of its subject in its Figure 4. Ex. 1005 ¶¶ 25–26; Ex. 1053 ¶ 13. We reproduce these two figures side by side below.

¹⁰ US 2011/0175987 A1, published July 21, 2011 (Ex. 1005).

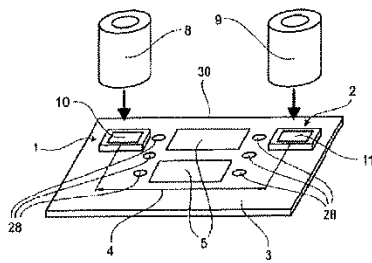


FIG. 3

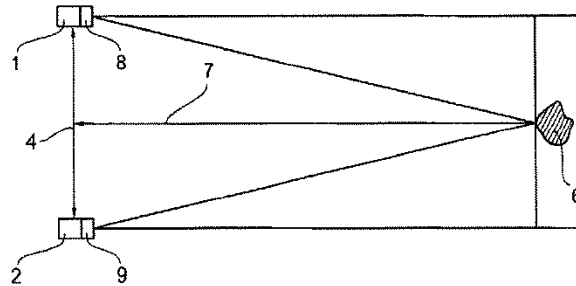


FIG. 4

Ex. 1005, Figs. 3–4. Figure 3 is a perspective view of the Hoffmeier system. *Id.* ¶ 25. Figure 4 shows a schematic structure of a stereo camera system with the Hoffmeier stereo camera system board. *Id.* ¶¶ 10, 26. The evidence supports that Hoffmeier’s lenses face forward in parallel rather than at an angle. *Id.* at Figs. 3–4, ¶ 35 (“The two optical systems 8, 9 can be coupled to the board 3 such that the respective optical axis of an optical system 8, 9 runs through the center point of the image sensing area 10, 11 of an image detection sensor 1, 2”); *see also* Ex. 1053 ¶ 14 (Petitioner’s expert opining that Hoffmeier’s Figure 4 “shows components 8 and 9 as having parallel axes”).

During prosecution, Patent Owner’s Chief Executive Officer (“CEO”), Dr. Jean-Philippe Thirion, who also is the named inventor for the ’119 and ’253 patents, submitted a response to the Examiner’s rejection. Ex. 1002, 88–107; Ex. 2019 ¶ 8. Notably, in that submission, Patent Owner admitted that Hoffmeier teaches claim 1’s “two different angles” recitation as follows:

Being devoid of any positioning system external to the stereovision system itself makes Hoffmeier quite different from the invention described in ’981 [(referencing the ’981 application that led to the ’119 patent)]. Hoffmeier therefore discloses “*A device for stereophotogrammetry comprising a camera body (1) and a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views*

according to two different angles” as in claim 1 of ’981, but it is all that Hoffmeier discloses relative to claim 1 of ’981.

Ex. 1002, 92 (bold emphasis added). Patent Owner further admitted that “8 and 9 in FIG 3 of Hoffmeier exactly correspond to 2b and 2c in FIG 2 of [the ’119 patent].” *Id.* at 91–92.

Patent Owner’s admissions during prosecution suggest to the public that Patent Owner understood that spaced optics with parallel optical axes fall within the scope of the disputed limitation. Patent Owner now downplays these admissions by arguing that Hoffmeier “is ambiguous as to whether the optical axes of 8, 9 are angled inwards, or are parallel.” PO Sur-reply 8. Any ambiguity does not help Patent Owner’s current position. Rather, despite the purported ambiguity, Patent Owner admitted that Hoffmeier taught “two views according to two different angles.” Ex. 1002, 92. The prosecution history, thus, suggests that the orientation of Hoffmeier’s optical axes is not important to whether the “two different angles” recitation is met. As such, Patent Owner’s prosecution history statements align with the present arguments of Petitioner, not Patent Owner.

D. Parallel Litigation

During district court litigation involving the ’119 patent, Patent Owner responded to Petitioner’s invalidity allegations regarding the Plassmann reference by agreeing that Plassmann teaches the now disputed “according to two different angles language.” Ex. 1037 (Patent Owner Response to Invalidity Chart), 2; *see also* Pet. Reply 6. Specifically, Patent Owner stated the following: “QuantifiCare agrees that the quoted language and figure include, *inter alia*, a double-optics comprising two sub-optics configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1037, 2.

Patent Owner now disputes that Plassmann teaches this recitation. *See, e.g.*, PO Resp. 27–30 (arguing that Petitioner’s contention that Plassmann acquires “two views according to two different angles” is incorrect). Thus, Patent Owner’s position in the district court litigation was consistent with its position during prosecution but inconsistent with its position in the current proceeding.¹¹ Thus, this inconsistency at least somewhat weighs against Patent Owner’s arguments.

In addition, we find unavailing Patent Owner’s argument that its agreement was subject to an objection that Petitioner failed to identify specifically where in Plassmann the limitation was taught. PO Sur-reply 9 (Ex. 1037, 2). Petitioner, however, clearly identified Plassmann’s Figure 1B and a passage describing it, which is the same structure Petitioner relies on here. Ex. 1037, 2.

We also find unavailing Patent Owner’s argument that this issue was raised belatedly by Petitioner. PO Sur-reply 8. As we discuss above, Petitioner may make this argument because it relates to issues of claim construction Patent Owner raises in its Response. CTPG, 45.

E. Summary

In view of the record as a whole, the weight of the evidence supports that claim 1’s “two views according to two different angles” language does not require that the optical axis of each sub-optic be angled differently, but instead requires only that the sub-optics view the subject from different

¹¹ Patent Owner argues that this extrinsic evidence should be disregarded. PO Sur-reply 8–9. We disagree. Although the extrinsic evidence is entitled to less weight, it nonetheless bolsters the intrinsic evidence establishing that Patent Owner—outside of the instant proceeding—understood “two views according to two different angles” means what Petitioner contends it means.

angles. Put differently, we conclude that this disputed limitation covers configurations of the two sub-optics that are spaced, regardless of whether the sub-optics' optical axes are orientated in parallel.

IV. PRINCIPLES OF LAW

“In an [inter partes review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring inter partes review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

A claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time of the invention to a person having ordinary skill in the art. *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of non-obviousness, if present. *See Graham*, 383 U.S. at 17–18. When evaluating a claim for obviousness, we also must “determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

V. OBJECTIVE INDICIA OF NONOBVIOUSNESS

Objective indicia of nonobviousness may include long-felt but unsolved need, failure of others, unexpected results, commercial success, copying, licensing, industry praise, and expert skepticism. *Mintz v. Dietz & Watson, Inc.*, 679 F.3d 1372, 1379 (Fed. Cir. 2012). Objective indicia are only relevant to the obviousness inquiry if there is a nexus between the claimed invention and the objective indicia of nonobviousness. *In re Affinity Labs of Tex., LLC*, 856 F.3d 883, 901 (Fed. Cir. 2017). A rebuttable presumption of nexus applies only “when [a patent owner] shows that the asserted objective evidence is tied to a specific product and that product ‘embodies the claimed features, and is coextensive with [the claims].’” *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (quoting *Polaris Indus. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1072 (Fed. Cir. 2018)). On the other hand, a patent owner is not entitled to a presumption of nexus if the patented invention is only a component of a commercially successful machine or process. *Id.* (reaffirming the importance of the “coextensiveness” requirement).

Applying *Fox Factory*, the Board uses a two-step analysis in evaluating nexus between the claimed invention and objective evidence of nonobviousness, also referred to as secondary considerations. *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 33 at 33 (PTAB Jan. 24, 2020) (precedential). We first consider whether Patent Owner has demonstrated “that its products are coextensive (or nearly coextensive) with the challenged claims,” resulting in a rebuttable presumption of nexus. *Id.* at 33. If not, that “does not end the inquiry into secondary considerations”; “the patent owner is still afforded an opportunity to prove nexus by showing that the evidence of secondary considerations is the ‘direct result of the unique

characteristics of the claimed invention.” *Id.* (quoting *Fox Factory*, 944 F.3d at 1373–75). For the reasons discussed below, we find that Patent Owner does not demonstrate (i) that its product is coextensive with the challenged claims for a presumption to attach, and (ii) the requisite nexus with evidence that the secondary considerations are the direct result of the unique characteristics of the claimed invention.

A. Presumption of Nexus

Patent Owner argues that “its LifeViz Infinity (‘Infinity’) product is disclosed and claimed in the patent.” PO Resp. 55 (citing Ex. 2013 ¶ 213). Patent Owner argues that Petitioner “does not dispute this assertion.” *Id.* (citing Pet. 81). “Therefore, nexus of secondary considerations regarding the Infinity to the invention is presumed,” according to Patent Owner. *Id.* (citing *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1330 (Fed. Cir. 2016)).

We disagree. Patent Owner does not provide an analysis demonstrating that its Infinity product is coextensive (or nearly coextensive) with the challenged claims. Rather, Patent Owner cites to the following testimony of Dr. van der Weide: “I have reviewed the LifeViz Infinity device and conclude that it embodies the invention of the [’]253 Patent. More specifically, the Infinity possesses all the features listed in claim 1 of the patent.” *Id.* (citing Ex. 2013 ¶ 213). Simply put, Patent Owner fails to provide any analysis whatsoever. *Id.*; *see also* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”).

Moreover, Patent Owner’s reliance on *WBIP* is misplaced. In that case, “WBIP presented evidence that specific products . . . [we]re embodiments of the invention as claimed in the asserted claims,” and that

provided a basis for finding a presumption of nexus. *WBIP*, 829 F.3d at 1329–31. Such is not the case here.

In sum, Patent Owner does not provide the required analysis demonstrating that Infinity is coextensive (or nearly coextensive) with the challenged claims. PO Resp. 55; *Lectrosonics*, Paper 33 at 33. We, therefore, find that a presumption of nexus is inappropriate.

B. Direct Result of the Unique Characteristics of the Claims

For the second step of our analysis, we look to whether Patent Owner demonstrates the requisite nexus with evidence that any secondary considerations are the direct result of the unique characteristics of the claimed invention. In particular, we address below Patent Owner’s arguments directed to the secondary considerations of (i) commercial success, (ii) copying, (iii) long-felt need, and (iv) praise for the invention. PO Resp. 55–66.

1. Commercial Success

For the commercial success indicia to support nonobviousness, Patent Owner needs “to show both commercial success and that a nexus exists between that success and the merits of the claimed invention.” *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1350 (Fed. Cir. 2012). We start with the latter of these requirements and look to Patent Owner’s arguments that a nexus exists between the purported commercial success and the challenged claims.

First, Patent Owner argues that “[a] nexus between sales of Infinity and the claimed invention is presumed because Infinity ‘is the invention disclosed and claimed in the patent.’” PO Resp. 61 (citing *WBIP*, 829 F.3d at 1330). We find this argument unavailing because as we find above,

Patent Owner does not demonstrate that a presumption should attach. *See supra* Section (V)(A).

We also find unavailing Patent Owner’s argument that “customers have identified claimed features as important to their use of the invention.” PO Resp. 61 (citing PO Resp. 59–60 (arguing that the claimed invention has received praise)). This argument does not address whether any sales, for example, of the Infinity product were owed to the merits of the claimed invention, nor that such purported praise lead to actual demand.

We also find unavailing Patent Owner’s argument that “Infinity sales were due to claimed features of the invention, *e.g.*, its ‘dual-distance’ functionality, which permitted customers to avoid buying multiple products or a non-portable multi-head system to accomplish the same tasks – as was noted by the EuroMediCom press release.” PO Resp. 62 (citing Ex. 2020,¹² 4). The announcement identifies the Infinity product as “BEST AESTHETIC DEVICE,” and describes the product, but does not evidence any specific demand for, or sales of, the Infinity product due to any features of the challenged claims. *See* Ex. 2020, 4. Nor does Patent Owner sufficiently address whether dual-distance functionality comprises the unique characteristics of the claimed invention.

We also find unavailing Patent Owner’s argument that “[t]he primary functional difference between [Petitioner’s] H2 and H1 [products] is that H2 can image the body (at a different distance) in addition to the face,” and that “[i]t follows that the large differential in production of the H2 as compared

¹² *Winners 2018-2019*, EuroMediCom (Jan. 29, 2021) <https://www.euromedcom.com/mca-2018/en/trophy/Winners-2018-2019.html>.

to H1 is due to that additional functionality.” PO Resp. 62 (citing Ex. 2034¹³ (arguing that Vectra H1 images face only); Ex. 2030¹⁴ (arguing that Vectra H2 captures a face or body image). Patent Owner provides no evidence for why this purported differential in production occurred; rather, Patent Owner speculates.

Second, we do not find that Patent Owner demonstrates commercial success of the Infinity product. To establish commercial success, Patent Owner relies on a declaration from its CEO, Dr. Thirion. PO Resp. 61–64 (citing Ex. 2019 ¶¶ 29–37). Although Dr. Thirion provides evidence of increasing sales of Infinity, Dr. Thirion does not give any specific information about unit sales, revenue, or the Infinity’s market share relative to the greater medical imaging market. Ex. 2019 ¶¶ 29–37.

In addition, we find unavailing Patent Owner’s argument that Petitioner “does not contest that its H2 infringes, and thus its sales are relevant to the invention’s commercial success.” PO Sur-reply 25 (citing *Truswal Sys. Corp. v. Hydro-Air Eng’g, Inc.*, 813 F.2d 1207, 1215 (Fed. Cir. 1987) & n. 12 (citing Ex. 2013 ¶¶ 215–219). We find insufficient support for Patent Owner’s assertion that Petitioner does not contest infringement. And we find Patent Owner’s reliance on *Truswal* misplaced. First, we note that Patent Owner cites to Judge Rich’s dissent in *Truswal*. Second, Judge Rich stated the “once an infringer is sued *and proved to be an infringer*, its sales are appropriately proved and added to the others,” and that “[i]t is necessary to establish that the alleged copies are actual infringements of the patent in suit before they can possibly be relevant and counted as successes

¹³ *Vectra H1 Quick Reference Guide*, Canfield (2014).

¹⁴ *Vectra H2: Capturing a FACE or BODY image*, Canfield.

of the patented invention.” *Truswal*, 813 F.2d at 1215 (Rich, J., dissenting).
Petitioner, as of now, has not been proved to infringe.

In sum, we find that Patent Owner does not show sufficient nexus between the purported commercial success and the claimed invention, and fails to show commercial success.

2. Copying

Patent Owner argues that Petitioner’s Vectra H2 “is a copy of *the invention*, in structure, function, operation, and use.” PO Resp. 64–66 (emphasis added). Patent Owner goes on to argue that Petitioner’s Vectra H2 mimics patented features and Infinity’s use of red and green light beamers. *Id.* at 64. Patent Owner emphasizes that Petitioner launched its H2 device “[e]ighteen months after Quantificare launched its Infinity.” *Id.* Based on these allegations, it is unclear whether Patent Owner alleges that Petitioner copied Patent Owner’s patent disclosure, subject matter of Patent Owner’s patent claims, or Patent Owner’s Infinity device.

Petitioner argues that it did not copy Patent Owner’s invention and identifies technical distinctions between the parties’ products. Pet. Reply 29–30. Petitioner’s expert, Dr. Otto, credibly opines that Petitioner’s choice of red and green light beamers was made for functional reasons (it is easier to get bright LEDs in red and green than in other colors). *Id.* (citing Ex. 1053 ¶¶ 80–81).

Here, Patent Owner lacks any evidence that Petitioner copied the ’253 patent or any claim of the ’253 patent. Patent Owner cites no evidence, for example, that Petitioner was aware of the ’253 patent during development of the H2 device. Patent Owner further lacks evidence that any particular aspect of the ’253 patent was copied. *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995) (“[M]ore than the mere fact of copying by an accused

infringer is needed to make that action significant to a determination of the obviousness issue.”) (citation omitted).

Patent Owner also lacks evidence that Petitioner copied any patented product. As we explain above, Patent Owner lacks evidence that the Infinity product is coextensive or nearly coextensive with any challenged claim; the record, thus, does not establish that Infinity is a “patented product” in a relevant sense.

Moreover, the Federal Circuit has held that “copying requires evidence of efforts to replicate a specific product, which may be demonstrated through internal company documents, direct evidence such as disassembling a patented prototype, photographing its features, and using the photograph as a blueprint to build a replica, or access to the patented product combined with substantial similarity to the patented product.” *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010). Here, Patent Owner lacks evidence that Petitioner studied any Patent Owner product or documents when developing the H2 device. To the contrary, the preponderance of the evidence supports that Petitioner’s H2 product differs from Patent Owner’s product, including because it refocuses at different distances (a design present in prior art systems). Ex. 1053 ¶¶ 79–81; *see also* Pet. Reply 29.

Thus, based on the record as a whole, Patent Owner’s allegation of copying is unpersuasive and does not support non-obviousness.

3. *Long-Felt Need*

Patent Owner argues that there was a long-felt need which the invention of the ’253 patent addresses. PO Resp. 55–59; PO Sur-reply 26. First, Patent Owner argues that in 2007, it “developed and launched the LifeViz stereophotogrammetry camera,” which “was a portable, handheld,

single camera device with one pair of beamers converging at the focus distance of the camera, and subjects were imaged at that distance.” PO Resp. 57 (citing Ex. 2019 ¶¶ 9–12).

Second, Patent Owner argues that “[a]t the time of invention [of the ’253 patent], there were no portable, ‘all-in-one’ handheld stereophotogrammetry devices for imaging both face and breast/torso.” *Id.* at 58 (citing Ex. 2019 ¶¶ 25–26, 29). “To image both, practitioners had to purchase one device for face and one for breast/torso, or purchase the large, costly multi-head Canfield XT,” which had disadvantages,” according to Patent Owner. *Id.* (citing Ex. 2019 ¶¶ 25–26, 29; Ex. 1001, 1:49–52).

Patent Owner argues that “[a]ccordingly, since at least the 2007 introduction of LifeViz, there was a long-felt need for a portable single-camera stereophotogrammetry device that avoided the disadvantages of purchasing multiple devices or a multi-head device like the Canfield XT.” *Id.* (footnote omitted) (citing Ex. 2013 ¶ 212; Ex. 2019 ¶ 30; Ex. 2020, 4).

“To address that deficiency, [Patent Owner] developed Infinity in 2015, filed for a patent thereon on October 14, 2015, and began commercial sales one year later,” according to Patent Owner. *Id.* at 59 (citing Ex. 2019 ¶¶ 28–29). Patent Owner argues that its Infinity product satisfied the long-felt need as demonstrated by industry praise and commercial success. *Id.* (citing Ex. 2019 ¶ 30; Ex. 2020, 4). Patent Owner also cites for support Dr. Otto’s deposition testimony that “it ‘was desired to do breast imaging,’ there was ‘a big demand’ to image ‘both areas,[]’ and [Petitioner] ‘didn’t want to have a separate product to do breast imaging.’” PO Sur-reply 26 (citing Ex. 2037, 17:22–18:17).

We find that Patent Owner does not show that there was a long-felt need that the claimed invention addresses. “[L]ong-felt need is analyzed as

of the date of an articulated identified problem and evidence of efforts to solve that problem.” *Texas Instruments Inc. v. U.S. Int’l Trade Comm’n*, 988 F.2d 1165, 1178 (Fed. Cir. 1993). Patent Owner does not show that the LifeViz product having only one pair of beamers converging at one distance was identified as a problem needing solution in 2007. *See* Ex. 2019 ¶¶ 9–12. Rather, Dr. Thirion testifies to the capabilities of the 2007 LifeViz product. *Id.* That a later generation product, such as Infinity, has additional capabilities does not evidence that a long-felt need existed and was met. Rather, evidence must be provided that shows there was an articulated identified problem and efforts to solve that problem, which Patent Owner does not do. Nor does Patent Owner provide evidence that Infinity was met with skepticism or that persons of ordinary skill in the art tried and failed to achieve the claimed invention.

Nor are we persuaded that industry praise and commercial success alone is sufficient to evidence a long-felt need that the claimed invention addresses. Both can exist without a long-felt need having existed. *See* Ex. 2019 ¶ 30 (testifying that Infinity created a new market for sales, but not providing direct evidence that a long-felt need had existed in the industry); Ex. 2020, 4 (stating that Infinity “is the first portable 3D imaging system capable of capturing face, body, and breast areas thanks to two sets of dual beamer pointers which allow for two distance settings,” but without stating it met a long-felt need). Furthermore, Dr. Otto’s deposition testimony cited by Patent Owner does not evidence that there was a long-felt need that the claimed invention solved. Ex. 2037, 17:22–18:17.

In sum, we find that Patent Owner does not show that there was a long-felt need. Moreover, Patent Owner does not provide analysis to show

the requisite nexus between the purported long-felt need and the unique characteristics of the claimed invention.

4. *Praise*

Patent Owner argues that Infinity won a prestigious award, the 2018 EuroMediCom Best Aesthetic Device Award, and that this award establishes industry praise. PO Resp. 59. In addition, Patent Owner argues that this award has nexus with the invention. *Id.* To that end, Patent Owner quotes three portions of the EuroMediCom announcement, and argues that “[t]his praise is squarely directed to the claimed invention.” *Id.* at 59–60 (citing Ex. 2020, 4; Ex. 2013 ¶ 214).

Below we produce the entirety of the announcement, and we italicize the portions Patent Owner quotes in its Response.

The LifeViz® Infinity is the first portable 3D imaging system capable of capturing face, body, and breast areas thanks to two sets of dual beamer pointers which allow for two distance settings. This unique system has two acquisition modes. A tripod mounted camera and turntable quickly capture a 360° 3D body image. Eight images are automatically taken and seamlessly stitched to produce a “life-like[”] 3D image of the body for visualization by the physician and patient. In hand-held mode, the camera is capable of generating 3D images of face and breast to simulate procedures and photo-document before/after interventions, without blocking an entire exam room with cumbersome equipment.

With a simple flip of a switch, dual beam pointers adjust to the distance ideal for face or body applications without the need for cumbersome repositioning and/or multi-headed systems. Superior image quality has been achieved by improving the optic performance. The LifeViz® Infinity produces excellent pictures from both near and far thanks to an increased deep field of view. Finally, a powerful external flash removes the need for specific lighting conditions and additional equipment ensuring reproducible images from one session to the next. The LifeViz® Infinity is comprised of a portable stereovision camera, a

software suite including an image database, 3D viewer tool, 3D skin analysis, face, breast, and body measurements and simulation modules. All aspects of 3D documentation, comparison, simulation, and measurement ranging from medical to cosmetic applications are possible with this single unique device.

Ex. 2020, 4 (*italics emphases added*). As can be seen above, the announcement broadly describes the Infinity product, including many additional features that Patent Owner does not identify, such as “a tripod mounted camera and turntable”; “[e]ight images are automatically taken and seamlessly stitched to produce a ‘life-like’ 3D image of the body for visualization”; “a powerful external flash”; and “a software suite including an image database, 3D viewer tool, 3D skin analysis, face, breast, and body measurements and simulation modules.” *Id.*

Patent Owner does not show that the purported praise is a direct result of the unique characteristics of the claimed invention. The announcement touts additional features of Patent Owner’s Infinity product. Based on the announcement, we cannot assess whether praise for Patent Owner’s product is grounded in a claimed feature, or other features, or a combination thereof. Patent Owner does not directly compare the announcement with the challenged claims, and does not clearly identify what Patent Owner contends are the unique characteristics of the claimed invention being praised. Moreover, the challenged claims are of varying scope, and Patent Owner does not address those differences.

In addition, Patent Owner argues that three “medical professionals’ praise is directed to the claimed invention.” PO Resp. 60–61 (citing

Ex. 2021,¹⁵ 11, 19–20). In particular, Patent Owner quotes from Dr. Lee’s testimonial that “[a]lthough regular 2D pictures are inconvenient, capturing a face or body in 3D with the 3D LifeViz® Infinity is easier. First of all, you have a unique device for standardized photography with a switch that adjusts the ideal distance for face and body.” *Id.* at 60 (citing Ex. 2021, 19). Patent Owner does not relate this portion of Dr. Lee’s testimonial to the claims, and fails to show that the purported praise is a direct result of the unique characteristics of the claimed invention.

In addition, Patent Owner quotes from the testimonial of Dr. Karimi who states that Infinity is “a state of the art, easy to use photographic system that has become an essential part of our consultation for face and body procedures.” *Id.* at 60 (citing Ex. 2021, 20). And Patent Owner argues that “Dr. Myriam Fopp uses LV Infinity for face (‘Wrinkles, Pores’) and body” and Dr. Fopp states that “[w]e also use our LifeViz® Infinity technology for body treatments.” *Id.* at 60 (citing Ex. 2021, 11). As above, Patent Owner does not relate these portions of Drs. Karimi’s and Fopp’s testimonials to the claims, including failing to show that the purported praise is a direct result of the unique characteristics of the claimed invention.

In sum, we find that Patent Owner does not show sufficient nexus between the purported praise and the claimed invention.

VI. ALLEGED OBVIOUSNESS OVER PLASSMANN, TREUILLET, AND STALLER

Petitioner argues that the combination of Plassmann, Treuillet, and Staller renders claims 1–4, 8–11, 15, 16, and 20 of the ’253 patent obvious. Pet. 5, 28–62. We have reviewed the parties’ arguments and the evidence of

¹⁵ *Testimonials: What our customers say*, QuantifiCare
<https://www.quantificare.com/learn/testimonials/>.

record, including the indicia of non-obviousness arguments. For the reasons that follow, we determine that Petitioner shows by a preponderance of the evidence that the combination of Plassmann, Treuillet, and Staller renders these claims obvious.

A. Summary of Plassmann

Plassmann is a World Intellectual Property Organization publication that relates to an apparatus for the production of stereoscopic images. Ex. 1007, at codes (10), (19), (57). Plassmann describes variations of the “MAVIS” system. *Id.* at 11:25–28. Plassmann’s apparatus captures “two images [which are] needed to form a stereo image . . . to produce a three-dimensional representation of the subject.” *Id.* at 12:25–29. The apparatus further includes two light emitting diodes (LEDs) emitting respective beams which converge at a particular distance in front of the apparatus. *Id.* at 12:7–13.

Below, we reproduce Plassmann Figures 1A and 1B.

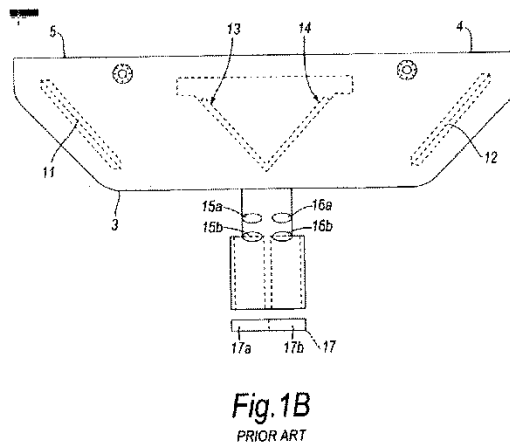
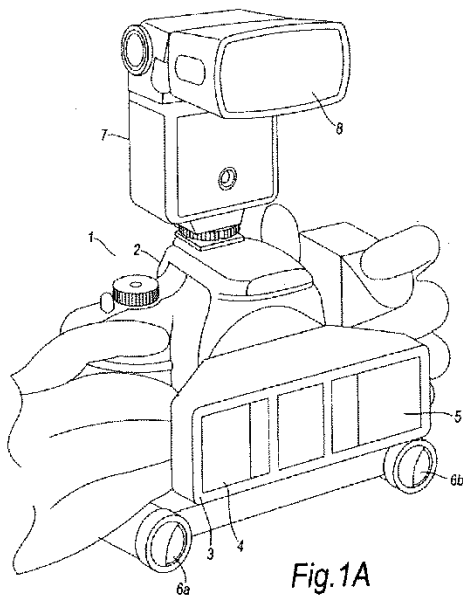


Figure 1A is a perspective representation of an apparatus for obtaining stereoscopic images, showing body 2 (e.g., a camera) and adaptor 3. *Id.* at 11:3–4, 11:28–12:4. Further Figure 1B shows a “plan view” of adaptor 3 in further detail. *Id.* at 11:5–6, 12:13–14. Adaptor 3 has two apertures 4, 5 which respectively collect light which is respectively focused onto charge coupled device parts 17a, 17b, forming respective first and second images. *Id.* at 12:15–25. The first and second images form a stereo image used to produce a three-dimensional representation of a subject. *Id.* at 12:25–29.

Additionally, as shown in Figure 1A, the apparatus includes

two low-powered light emitting diodes (LEDs) 6a, 6b, each provided with a [focusing] lens to produce a beam of light and being arranged so that the beams converge and meet at a point a fixed and desired distance from the apparatus, this distance corresponding to the distance at which the camera lens is [focused].

Id. at 12:8–13. The converging beams act as “a guide to show distance between the apparatus and subject.” *Id.* at 16:12–14.

B. Summary of Treuillet

Treuillet is a paper that relates to an “approach to build 3-D models of skin wounds from color images.” Ex. 1016, 752. Treuillet explains that “[b]y taking two color images from different points of view, stereophotogrammetry allows the computation of the 3-D coordinates of numerous points on the skin lesion.” *Id.* at 754.

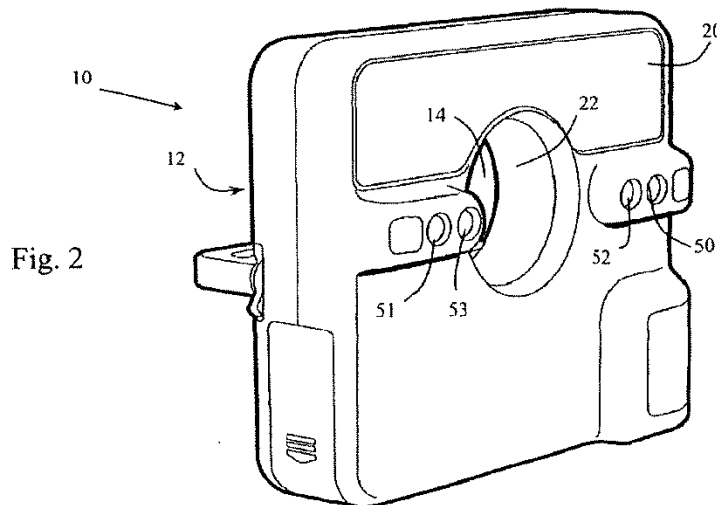
By way of imaging technology background, Treuillet describes the MAVIS II system as “a reflex digital camera equipped with special dual lens optics for recording two images from slightly different viewpoints, generating a stereo pair” which includes “two tube-shaped projectors produce beams of light which intersect in a single spot when the camera is

held at the right distance” at “about 80 cm from the wound,” with a tolerance of plus or minus 15 cm. *Id.* at 755.

C. Summary of Staller

Staller is a US patent that relates to a diffuser attachment for a camera including a “distance measurement device [that] uses a pair of light beams which intersect at a repeatable distance from the diffuser body to readily enable positioning of an object to be photographed at that repeatable distance.” Ex. 1006, code (57).

Below, we reproduce Figure 2, which shows a front perspective view of a diffuser. *Id.* at 3:13–14.



As shown in Figure 2, the diffuser “includes a distance measurement device or indicator in the form of a plurality of light beam emitters 50–53.” *Id.* at 5:13–15. “Each pair of emitters 50–51, 52–53 creates a pair of angled light beams which intersect at different distances in front of diffuser body 12.” *Id.* at 5:17–18. As such, “[e]ach of the pairs of light beams allows diffuser 10 to be relocated at the same repeatable distance from a subject.” *Id.* at 5:18–21;

see id. Fig. 4. That is, each pair of emitters indicates a different distance. *Id.* at 2:30–35, 5:64–6:2.

Further, either of the emitter pairs, i.e., pair 50–51 or pair 52–53, are selected using a selector switch. *Id.* at 5:38–41. By selecting a particular emitter pair, the distance measurement device indicates a particular distance measurement. *See id.*

D. Challenged Claim 1

1. Device for Stereophotogrammetry (Preamble)

Petitioner argues that Plassmann teaches “[a] device for stereophotogrammetry,” as recited in the preamble of claim 1. Pet. 28–29. More specifically, Petitioner argues that Plassmann teaches “a device for stereophotogrammetry including an adaptor (3) attached to a camera body (2) to capture stereo images.” *Id.* (citing Ex. 1007, Figs. 1A–1B; Ex. 1003 ¶ 229). Petitioner argues that “[t]he adaptor acquires two views of an object from two different angles via mirrors 11 and 12,” and that “Plassmann describes their use to reconstruct a 3-D representation of imaged objects.” *Id.* at 29 (citing Ex. 1007, 12:25–29). According to Petitioner, one of ordinary skill in the art “would understand Plassmann discloses a device for stereophotogrammetry.” *Id.* (citing Ex. 1003 ¶ 230).

After reviewing Petitioner’s arguments and evidence, which are not addressed by Patent Owner (*see generally* PO Resp.), we determine that Petitioner demonstrates by a preponderance of the evidence that Plassmann teaches claim 1’s preamble.

2. Camera Body

Petitioner argues that Plassmann teaches “a camera body (1),” as recited in claim 1. Pet. 29–30. More specifically, Petitioner argues that Plassmann teaches camera body 2. *Id.* (citing Ex. 1007, Fig. 1A; Ex. 1003

¶ 231). Petitioner adds that Plassmann teaches using “a camera body such as is well-known to those skilled in the art.” *Id.* at 30 (quoting Ex. 1007, 5:29–30, 12:3–4).

After reviewing Petitioner’s arguments and evidence, which are not addressed by Patent Owner (*see generally* PO Resp.), we determine that Petitioner demonstrates by a preponderance of the evidence that Plassmann teaches “a camera body (1).”

3. Double-Optics Comprising Two Sub-Optics

Claim 1 further recites “a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1020, 11:43–45. We agree with Petitioner and find that Plassmann teaches this limitation. Pet. 30–32.

Petitioner annotates Plassmann’s Figure 1B, which is shown below with Petitioner’s annotations. *Id.* at 31.

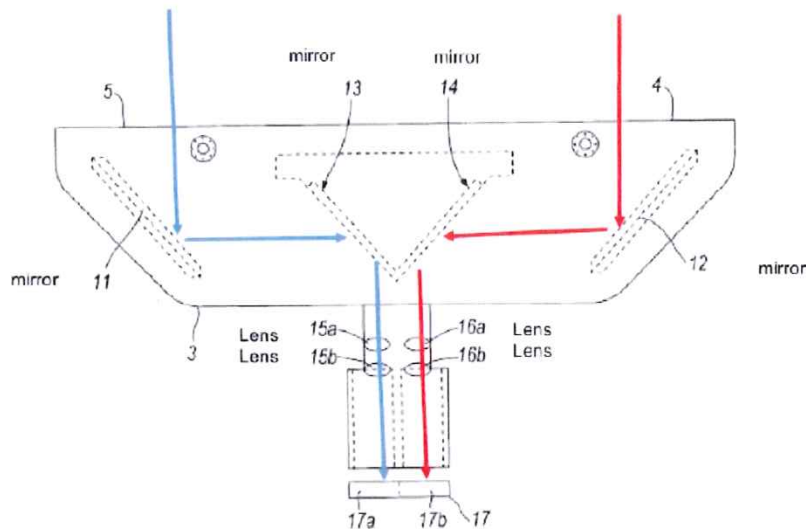


Fig.1B
PRIOR ART

Plassmann teaches that Figure 1B depicts “a plan view of a known adaptor used in” “a known apparatus for obtaining stereoscopic images.” Ex. 1007, 11:3–6. Petitioner annotates the figure with blue lines indicating an exemplary first light path through aperture 5 to charge coupled device part 17a, which Plassmann describes as follows: “Light passing through aperture 5 hits mirror 11 and then mirror 13 before passing through lenses 15a, 15b. Lenses 15a, 15b focus the light so that, when the shutter of the camera is pressed, light is focussed onto part 17a of a charge coupled device 17 so as to form a first image.” Pet. 30–31 (annotating Ex. 1007, Fig. 1B, citing 12:14–25); Ex. 1007, 12:15–20. Similarly, Petitioner annotates the figure with red lines indicating an exemplary second light path through aperture 4 to charge coupled device part 17b, which Plassmann describes as follows: “[L]ight passing through aperture 4 hits mirror 12 and then mirror 14 before passing through lenses 16a, 16b. Lenses 16a, 16b focus the light so that, when the shutter of the camera is pressed, light is focussed onto part 17b of the charge coupled device 17 so as to form a second image.” Pet. 30–31 (annotating Ex. 1007, Fig. 1B, citing 12:14–25); Ex. 1007, 12:20–25.

We agree with Petitioner and find that one of ordinary skill in the art would have recognized that the combination of mirrors and lenses comprises double-optics employing two sets of sub-optics (*i.e.* 11, 13, 15a, and 15b (blue) and 12, 14, 16a, and 16b (red)). Ex. 1007, 12:14–25, Fig. 1B ; Ex. 1003 ¶ 235; Pet. 32. More specifically, we agree with Petitioner and find that Plassmann teaches having two sub-optics, which are displaced from one another, and which each collect light from the subject to be imaged (viewed). *See, e.g.*, Ex. 1007, 12:14–25, Fig. 1B. Plassmann teaches that the light collected by each sub-optic comprises the light that passes through the respective aperture 4 or 5, and traverses different sets of mirrors and

lenses to be focused on a different part of a charged coupled device to form respective first and second images (views). *Id.* at 12:14–25, Fig. 1B.

We also agree with Petitioner and find that due to spaced mirrors 11 and 12—which are part of different light paths and which are hit by the light that passes through their respective aperture 4 or 5—the two images (views) are necessarily acquired at different angles. Ex. 1007, 12:14–25, Fig. 1B; Ex. 1003 ¶ 235; Pet. 32. Moreover, each sub-optic receives light from, for example, the center point of the object to be imaged from a different angle due to the spaced mirrors 11 and 12, as well as depending on the curvature of the subject and which point on the subject from which the light originates. *Id.*; see also PO Resp. 28 (admitting that “[i]t is true that, when a subject is imaged using a stereophotogrammetry device having two sub-optics, the ‘angle’ between a point of the subject and each sub-optic is different”).

In addition, the ’253 patent Specification describes the claimed double optics as follows: “A double optics (2) adapted to the camera body (1) and composed of two sub-optics (2b) and (2c), enabling the acquisition of a stereo pair corresponding to two slightly different viewing angles.” Ex. 1020, 8:35–38. Notably, the passage provides that having two sub-optics enables acquiring a stereo pair “corresponding to two slightly different viewing angles,” without addressing the sub-optics’ orientation. *Id.*

Lastly, we agree with Petitioner and find that because images (views) are captured using a single camera, one of ordinary skill in the art would have understood they are obtained simultaneously. Ex. 1003 ¶ 235.

We find unavailing Patent Owner’s arguments disputing that Plassmann teaches this limitation. PO Resp. 23–30. Patent Owner’s arguments are premised on its construction (which we do not adopt) of the plain and ordinary meaning for this limitation which excludes parallel view

sub-optic configurations. *Id.* Put differently, Patent Owner argues that having the sub-optics spaced apart from each other is insufficient to teach “two views according to two different angles.” *Id.* As we discuss above, this is incorrect. Thus, Patent Owner’s discussions regarding the optical axes of the sub-optics and their orientations are inapposite in light of the proper construction for “two views according to two different angles.” *Id.*

Moreover, we afford the testimony of Dr. van der Weide, Patent Owner’s expert, little weight with regard to this issue, as it is based on the incorrect claim construction for “according to two different angles,” and does not explain otherwise a basis for the testimony that the two images are acquired at the same angle. Ex. 2013 ¶¶ 113–141.¹⁶

In sum, we are persuaded that Petitioner demonstrates by a preponderance of the evidence that Plassmann teaches “a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views according to two different angles.”

4. *Wherein the Device is Comprising a Positioning System*

The remaining limitation of claim 1 reads as follows:

wherein the device is comprising a positioning system (34) configured to signal when a target subject (S) is reaching a pre-defined distance position to the camera (1) corresponding to one of at least two distinct pre-defined distance positions (A3, A4) of the target subject (S) relative to the camera body (1) of the stereophotogrammetry device, the at least two distinct predefined distance positions comprising a closer distance position (A4) and a farther distance position (A3), the closer

¹⁶ Petitioner argues that Plassmann and its Figure 3A suggest that its sub-optics are angled inwardly such that this recitation would be met “[e]ven if the Board were to exclude parallel suboptics from the claims.” Pet. Reply 8. It is not necessary to reach this issue because we did not adopt Patent Owner’s construction.

distance position (A4) being closer to the camera body (1) of the stereophotogrammetry device than the farther distance position (A3) to the camera body (1) of the stereophotogrammetry device.

Ex. 1020, 11:46–57. We agree with Petitioner and find that the combination of Plassmann, Treuillet, and Staller teaches this limitation. First, we agree with Petitioner and find that Plassmann teaches a positioning system that uses a pair of light beamers to signal when a target subject is reaching a predefined distance position to the camera. *See* Ex. 1007, Fig. 1A (light beamers 6a, 6b); Pet. 33. Plassmann teaches that light beams converge at a predefined distance “corresponding to the distance in which the camera lens is focussed.” Ex. 1007, 12:7–13. More specifically, Plassmann states the following:

The apparatus is also provided with two low-powered light emitting diodes (LEDs) 6a, 6b, each provided with a focussing lens to produce a beam of light and being arranged so that the beams converge and meet at a point a fixed and desired distance from the apparatus, this distance corresponding to the distance at which the camera lens is focussed.

Id.; Pet. 34. Accordingly, we find that Plassmann teaches the limitation, save for having a second predefined distance position—if there are two different distance positions, one necessarily is closer to the camera body and the other one farther. Ex. 1007, 12:7–13, Fig. 1A.

Second, we agree with Petitioner and find that Staller teaches a positioning system having more than one predefined imaging distance position. Pet. 38. More specifically, we find that Staller teaches a strobe diffuser attachment for a camera, which includes a “distance measurement device [that] may be adapted to selectively produce one of a plurality of pairs of light beams which intersect at different repeatable distances from the diffuser body.” Ex. 1006, code (57), 2:29–32, 5:13–15; *see also id.* at 5:56–

6:2 (“[T]wo pairs of light beam emitters . . . may be used to provide three or four separate pairs of intersecting bea[m]s and three or four corresponding repeatable distances for diffuser 10.”); Pet. 38. In other words, Staller teaches having at least two distinct predefined distance positions for the camera. Ex. 1006, code (57), 2:29–32, 5:13–15, 5:56–6:2.

We also agree with Petitioner and find that Staller teaches that its “distance indicator improves the usefulness of close range photography by providing a repeatable scale to photographs[, which] . . . improves the usefulness of close ranges photographs for medical and other organic growth measurement applications.” Ex. 1006, 6:10–15; Pet. 38. In addition, we agree with Petitioner and find that Plassmann teaches that “[s]tereoscopic imaging has been known for many years,” and “ha[s] been used to measure the shape of wounds and the like which are otherwise difficult to measure by conventional techniques.” Ex. 1007, 1:6–15; Pet. 35. We also agree with Petitioner and find that it was known in the art before the ’253 patent to use a camera having multiple predefined distances for imaging a subject in connection with wound or lesion treatment. *See* Ex. 1017,¹⁷ 579; Ex. 1011,¹⁸ 164, Fig. 2, Table 2; Ex. 1008,¹⁹ 481.

Thus, in light of the above, we find that one of ordinary skill in the art would have found it obvious to modify Plassmann’s stereophotogrammetry device, based on what was known in the art, which includes Staller’s

¹⁷ Gwen Clarke, *Recording Wounds: Polaroids New Medically Designed Camera*, British Journal of Community Nursing, vol. 5, no. 11 (Sept. 27, 2013) (“Clarke”).

¹⁸ Melvin A. Shiffman, *A New Camera for Cosmetic Surgery*, The Am. J. Cosmetic Surgery, vol. 15, no. 2 (June 1, 1998) (“Shiffman”).

¹⁹ Clare Williams, *Wound care assessment with the Polaroid Macro 3 SLR*, British J. Community Nursing, vol. 6, no. 9 (2001) (“Williams”).

teachings, to have multiple predefined distance positions for repeatability. Plassmann already teaches use of one pair of light beams for positioning, and a person of skill in the art would have understood that the Plassmann device could benefit from multiple pairs of light beams in the same way the Staller device benefits from the multiple pairs of light beams to enable positioning at more than one repeatable distance from the camera. Ex. 1003 ¶¶ 138–139; *KSR*, 550 U.S. at 417 (“[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.”).

We find unavailing Patent Owner’s arguments that Plassmann’s camera needs to be “optimally focused,” which occurs at a single fixed distance, and thus, one of ordinary skill in the art would not add a second distance. PO Resp. 31–36; PO Sur-reply 17–20 (making similar arguments that optimal focus to ensure precision and accuracy of the image of a wound).²⁰ We also find unavailing Patent Owner’s argument that Plassmann teaches “the distance at which the camera lens is focussed,” and thus, one of ordinary skill in the art would understand that Plassmann “refers to the

²⁰ Patent Owner refers to Exhibits 2039 and 2040 in its Sur-reply. Patent Owner used these exhibits (which Petitioner served on Patent Owner, but did not file in this proceeding) during a deposition of Dr. Otto, and filed them in this proceeding with its Sur-reply, which is late under our Rules. See Paper 41 (Order), 3 (authorizing refiling of exhibits to correct numbering, but stating that “this order does not address the merits of whether or not the exhibits at issue are proper”). We consider these exhibits in evaluating Dr. Otto’s testimony, but “not as evidence supporting [Patent Owner’s] arguments on the merits.” *Ascend Performance Materials Operations LLC, v. Samsung SDI Co.*, IPR2020-00349, Paper 53, at 12 (PTAB, July 15, 2021). Regardless, the disclosures in these exhibits do not change our depth of field analysis.

singular distance where the lens is optimally-focused.” PO Resp. 34–35 (quoting Ex. 1007, 12 (alteration in original); citing Ex. 2013 ¶ 152).

These arguments are contrary to the well-known concept of “depth of field.” As both parties’ experts and the ’253 patent acknowledge, depth of field is the region in which an image is focused or sharp. *See* Ex. 1003 ¶ 37 (quoting Ex. 1001, 6:15–16²¹) (“Like any camera, stereophotogrammetry devices employ lenses that provide a certain depth of field. This depth of field is ‘the distance separating the two planes within which the image is focused.’”); Ex. 2006 ¶ 47 (quoting Ex. 1020, 4:20–24) (“[T]he two predefined distances are included within . . . the space within which the image is sharp, that is . . . the depth of field.”). And Plassmann’s teaching of “the” distance refers to where the beams converge at the pre-defined distance where there is focus (i.e., within the depth of field), rather than limiting the depth of field to a single point of focus. Ex. 1007, 12 (“[T]he beams converge and meet at a point a fixed and desired distance from the apparatus, this distance corresponding to the distance at which the camera lens is focussed.”).

Moreover, stereophotogrammetry devices having sufficient depth of field were known in the art. Ex. 1003 ¶¶ 113, 115, 385; Pet. Reply 19; *see Randall Mfg. v. Rea*, 733 F.3d 1355, 1362–63 (Fed. Cir. 2013) (providing that it is appropriate to consider such knowledge as part of an obviousness analysis). For example, Treuillet teaches with respect to the MAVIS II stereophotogrammetry device that “[t]o simplify the image capture, two tube-shaped projectors produce beams of light which intersect in a single

²¹ Dr. Otto quotes from the Specification of the ’119 patent, which is the parent of the ’253 patent and shares a common Specification. In the ’253 patent, this passage is contained within lines 20–24 of column 4.

spot when the camera is held at the right distance (about 80 cm from the wound),” and that “[e]xact positioning is not required: images can be taken in a volume of ± 15 cm around this point.” Ex. 1016, 755. This teaching that exact positioning is not required, and that images can be taken within a 30 cm region evidences the depth of field for the MAVIS II. Ex. 1016, 755; Ex. 1053 ¶¶ 55–56.

We find unavailing Patent Owner’s argument that Treuillet’s teaching that the beams of light intersect at “the right distance” equates to “the distance of optimal focus or where the image is sharpest,” and limits the MAVIS II to using that distance. PO Resp. 36 (citing Ex. 1016, 755; Ex. 2013 ¶ 154). This teaching refers to reaching the pre-defined distance, rather than limiting the depth of field. Ex. 1016, 755. We also find unavailing Patent Owner’s arguments that Treuillet teaching that “images can be taken in a volume of ± 15 cm” does not teach a depth of field, and that “[c]an” is not “should.” PO Resp. 41–42 (citing Ex. 2013 ¶¶ 180–182). This teaching directly corresponds to what depth of field means and “can” expresses that capability of taking focused images within the depth of field. Ex. 1016, 755; Ex. 1003 ¶ 37; Ex. 2006 ¶ 47; Ex. 1001, 6:15–16; Ex. 1020, 4:20–24.

In addition, Hoeffelin²² teaches a stereophotogrammetry device having a 40 cm depth of field, which is sufficient to image both the face and torso. See Ex. 1015, 8–9 (disclosing “that the focal length needs to be respected (between 80 and 120 cm)”); Ex. 1003 ¶ 169; Ex. 1053 ¶ 61. We find unavailing Patent Owner’s argument that Hoeffelin teaches that “the

²² H. Hoeffelin, et al., *A Methodological Evaluation of Volumetric Measurement Techniques including Three-Dimensional Imaging in Breast Surgery*, BioMed Research Int’l, vol. 2014, 8 (Jan. 2014) (Ex. 1015).

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focal length needs to be respected,” or otherwise brings risk of distortion. PO Resp. 36–37 (citing Ex. 1015, 8–9; Ex. 2013 ¶ 156). Patent Owner ignores the “(between 80 and 120 cm)” range that immediately follows and modifies the focal length statement, and expresses a depth of field. Ex. 1015, 8–9.

Moreover, we find unavailing Patent Owner’s arguments to the extent that they focus only on Plassmann’s depth of field. *See* PO Resp. 31–36; PO Sur-reply 17–20. These arguments are directed to Plassmann’s teachings individually, which is the incorrect focus. *Cf. In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (“Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references”); *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). In addition, these arguments are akin to arguing that Plassmann and Treuillet’s teachings cannot be physically combined, which is an improper focus for determining non-obvious. *See Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (quoting *In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983)); *see also id.* (quoting *In re Etter*, 756 F.2d 852, 859 (Fed. Cir. 1985) (en banc)) (“Etter’s assertions that Azure cannot be incorporated in Ambrosio are basically irrelevant, the criterion being not whether the references could be physically combined but whether the claimed inventions are rendered obvious by the teachings of the prior art as a whole.”).

We also find unavailing Patent Owner’s argument that that there would be no reason to combine Staller’s teachings with Plassmann because Plassmann has no need for additional beamers to provide repeatable scale. PO Resp. 38. More specifically, Patent Owner argues that “with Plassmann, the scale of the 3D reconstruction is already known exactly from the

calibration and triangulation methodology,” and “[t]herefore, Plassmann already enables wound images to be viewed over successive examinations at repeatable scale(s) and at varying levels of magnification.” *Id.* (citing Ex. 2013 ¶ 165). Even if, as Patent Owner argues, one of ordinary skill in the art could develop or utilize different solutions to address scale, this does not make Staller’s solution less obvious. *Cf. Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (“[A] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.”). Moreover, the ability to consistently take images from different positions using multiple beamers would still have utility.

We also find unavailing Patent Owner’s argument that “Treuillet criticizes MAVIS II, calling it ‘cumbersome’ and stating ‘all the previous systems are unsuitable for general use in clinical settings.’” PO Resp. 43 (quoting Ex. 1016, 752, 755, 761). Patent Owner further argues that Treuillet criticizes that Plassmann’s MAVIS II requires “careful calibration.” *Id.* at 44. These arguments, however, do not undermine our finding above that a person having ordinary skill in the art would have understood that the MAVIS II device had a useable depth of field and that Plassmann would benefit from having multiple positioning beamers within that depth of field. Treuillet does not denigrate the notion of using multiple beamers with MAVIS II. *Cf. In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004) (“The prior art’s mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the [claimed solution].”).

In summary, we are persuaded that Petitioner (i) demonstrates by a preponderance of the evidence that the combination of Plassmann, Treuillet,

and Staller teaches this limitation, and (ii) provides sufficiently articulated reasoning with rational underpinning to support Petitioner's combining of Plassmann, Treuillet, and Staller's teachings for this limitation. *See Kahn*, 441 F.3d at 988 (citations omitted), *cited with approval in KSR*, 550 U.S. at 418.

5. *Summary*

In summary, we determine that Petitioner shows by a preponderance of the evidence that claim 1 would have been obvious to one of ordinary skill in the art in view of the combination of Plassmann, Treuillet, and Staller.

E. Challenged Claims 2–4, 8, 9, 15, 16, and 20

Petitioner argues that the combination of Plassmann, Treuillet, and Staller teaches the limitations recited in claims 2–4, 8, 9, 15, 16, and 20. Pet. 42–50, 58–62. Patent Owner's Response does not separately address Petitioner's arguments directed to these claims. PO Resp. 46.

Based on the evidence and arguments of record, we find that Petitioner demonstrates by a preponderance of the evidence that claims 2–4, 8, 9, 15, 16, and 20 would have been obvious to one of ordinary skill in the art over the combination of Plassmann, Treuillet, and Staller.

F. Challenged Claim 10

Claim 10 recites “[t]he device according to claim 1 wherein the closer distance position (A4) and the farther distance position (A3) are such that a surface of a field of view corresponding to the farthest distance position (A3) is at least 25% larger than a surface of a field of view corresponding to the closer point position (A4).” Ex. 1020, 12:53–58. To address this recitation, Petitioner argues that it would have been obvious to a person

having ordinary skill in the art to define a farther position 25% larger than the closer position. Pet. 51. Petitioner persuasively argues that Plassmann and Treuillet both disclose that Plassmann could be used for wound monitoring. *Id.* at 51–52. Petitioner also persuasively argues that a person of ordinary skill in the art would have understood that wound-monitoring devices could employ close and far positions which differ in magnification by more than 200%. *Id.* A preponderance of the evidence including the Clarke reference evidences this point. Ex. 1017, 579–80; Ex. 1003 ¶ 286.

Petitioner further argues a person having ordinary skill in the art would have also understood that a Plassmann-type stereophotogrammetry device could be used for imaging face or breasts. Pet. 52. A preponderance of the evidence also supports this position. The '253 patent acknowledges that separate stereophotogrammetry devices had been used for 3D reconstructions of face and breasts in A3 and A4 surface format. Ex. 1020, 1:46–59; Ex. 1003 ¶ 287.

Petitioner's expert, Dr. Otto, calculates that Plassmann's 30-centimeter depth of field would be sufficient to encompass a "surface field of view" equivalent to the A4 format and equivalent to the A3 format (different by more than 25%). Pet. 52–53 (citing Ex. 1003 ¶ 289). Dr. Otto also testifies that, while Plassmann and Treuillet do not disclose focal length of the Plassmann device's lenses, a person having ordinary skill in the art would understand that different lenses could be employed to achieve different results. *Id.* at 53 (citing Ex. 1003 ¶¶ 164–172, 291–292). Dr. Otto further explains that a person of ordinary skill would have known how to configure a Plassmann device to take both A3 and A4 formats within the depth of field of the Plassmann device. *Id.* at 53–54. Dr. Otto further explains that a person of ordinary skill would have understood that any

suitable lens could be used to achieve imaging goals. *Id.* at 53–54 (citing Ex. 1003 ¶ 290); *see also id.* (citing Ex. 1003 ¶¶ 164–172, 291–292).

Petitioner further argues that a person having ordinary skill in the art would have known that similar stereophotogrammetry devices could image face and bodies, such as the LifeViz II device. Pet. 54–55; Ex. 1014,²³ 2 (depicting images of faces and breasts using LifeViz II); Ex. 1003 ¶¶ 168, 292. Petitioner argues that Hoeffelin teaches that LifeViz II has a depth of field from 80–120 cm and that a person of ordinary skill in the art would have thus understood that a 40-centimeter depth of field would be sufficient to encompass A4 format and 100% larger A3 format. Pet. 55–56 (citing Ex. 1003 ¶¶ 170–171, 292; Ex. 1015, 8–9). Dr. Otto confirmed that such a device could encompass these formats. *Id.* at 56 (citing Ex. 1003 ¶¶ 171, 292).

Patent Owner argues that Otto’s analysis and conclusions are flawed. PO Resp. 46–54; PO Sur-reply 22–25. More specifically, Patent Owner argues, as Petitioner acknowledges, that neither Plassmann nor Treuillet disclose the actual focal length of the lenses, and Patent Owner argues that this means neither references teaches “field of view.” PO Resp. (citing Ex. 2013 ¶¶ 192–193; Ex. 1003 ¶ 290). Patent Owner, thus, emphasizes that Dr. Otto relies on replacing Plassmann’s lenses to reach A4 and A3 formats. *Id.* at 47.

Patent Owner then argues that Otto’s calculations and approach err because they are based on a single pyramidal view rather than considering, as necessary for stereophotogrammetry, the intersection of two separate view frustums. *Id.* at 48. Patent Owner’s witness, Dr. van der Weide,

²³ 3D LifeViz website (Jan. 31, 2014).

explains this purported error. Ex. 2013 ¶¶ 196–199. Patent Owner further argues that depth of field is controlled by lens aperture and that Dr. Otto could not evaluate Plassmann’s depth of field without lens aperture dimensions. PO Resp. 49–50 (citing Ex. 2013 ¶ 200).

Patent Owner also argues that, even under Dr. Otto’s calculations, the subject would have to be imaged 64.5 cm from the camera which is outside of the 65–95 cm depth of field Dr. Otto calculates. *Id.* at 50 (citing Ex. 1003 ¶ 164; Ex. 2013 ¶ 201).

Patent Owner also disputes that Petitioner and Dr. Otto correctly contend that LifeViz II could image the face and torso. *Id.* at 50–53. Patent Owner emphasizes that the face image is from a QuantifiCare advertisement while the torso image is from Hoeffelin, which uses a different camera. *Id.* (citing Ex. 1014, 1–2; Ex. 1015, 2–4; Ex. 2013 ¶¶ 204–205; Ex. 2019 ¶¶ 20–24). Patent Owner further argues that Hoeffelin only provides focal length rather than depth of field. PO Resp. 53 (citing Ex. 1005, 8–9; Ex. 1015, 4; Ex. 2013 ¶ 206).

Patent Owner then argues that, because of Dr. Otto’s analytic errors, Petitioner has not shown that modified devices would meet claim 10 or that a person having ordinary skill in the art could determine how to modify the devices with a reasonable expectation of success. *Id.* at 54.

Considering all of evidence before us, the preponderance of the evidence supports that a person having ordinary skill in the art would have had reason to configure Plassmann as claim 10 recites (to be able to take both face and breast stereo-photos) and would have understood how to employ suitable lenses and focus distances to achieve claim 10’s field of view. We find Dr. Otto’s testimony credible and Petitioner’s position persuasive based on the evidence the Petition cites.

In particular, the preponderance of the evidence suggests that a person of skill in the art would have known the benefit of creating stereophotogrammetric 3-D images of both faces and breasts. *See* Ex. 1020, 1:56–59 (disclosing a specialist creates images of faces and breasts); Ex. 1014, 2 (suggesting that LifeViz device can create 3-D face image); Ex. 1015, 3 (suggesting LifeViz device can create 3-D breast images). The preponderance of the evidence further supports that a person having ordinary skill in the art would have known that the device described by Plassmann and Treuillet could be configured to create these images with a reasonable expectation of success by making use of various lenses, focal lengths, depths of field, and so forth to define closer and farther imaging positions as desired and, in particular, to reach the recitations of claim 10 for face and breast imaging. Pet. 54; Ex. 1003 ¶ 172; Ex. 1053 ¶¶ 69–74.

Patent Owner’s argument that Dr. Otto miscalculates the precise adjustments that would allow such imaging (PO Resp. 46–55) do not undermine Petitioner’s rationale as to why a person having ordinary skill in the art would combine the references’ teachings to reach claim 10 or would have reasonable expectation of success reaching claim 10. As Petitioner points out, Patent Owner lacks evidence that would undermine Petitioner’s position that such a device would have been desired and achieving such a device would have been within the ordinary skill in the art. Pet. Reply 21. Thus, the preponderance of evidence as to this more general proposition remains true even if Patent Owner were correct that Dr. Otto’s precise calculations were in error. Petitioner does not have a burden to provide precise dimensions of an obvious device within the scope of claim 10. Rather, Petitioner needs to show that a person having ordinary skill in the art would have had both reason and reasonable expectation of success as to

reaching claim 10's recitations. As we explain above, Petitioner meets this burden.

In sum, we find that Petitioner demonstrates by a preponderance of the evidence that claim 10 would have been obvious to one of ordinary skill in the art over Plassmann, Treuillet, and Staller.

G. Challenged Claim 11

Claim 11 recites the following:

The device according to claim 1 wherein the field of view corresponding to the closer distance position (A4) is equal to a normalized surface format A4, that is 21 cm times 29.7 cm, with possible variation of plus or minus 40% of a surface of the normalized surface format A4 and the field of view corresponding to the farther distance position (A3) is equal to a normalized surface format A3, that is 29.7 cm times 42 cm, with possible variation of plus or minus 40% of a surface of the normalized surface format A3.

Ex. 1020, 12:59–67. For largely the same reasons as claim 10, Petitioner argues that it would have been obvious to a person having ordinary skill in the art to select a field of view that corresponds to A3 surface format and a second field that corresponds to A4. Pet. 56–58. Patent Owner argues that Petitioner does not meet its burden for the same reasons as claim 10. PO Resp. 55. As we explain above, the preponderance of the evidence supports Petitioner's position. *See also* Ex. 1003 ¶¶ 295–298 (Dr. Otto addressing claim 11).

In sum, we find that Petitioner demonstrates by a preponderance of the evidence that claim 11 would have been obvious to one of ordinary skill in the art over Plassmann, Treuillet, and Staller.

VII. ALLEGED OBVIOUSNESS OVER PLASSMANN,
TREUILLET, STALLER, AND KINGSLAKE

Petitioner argues, with specific cites to the record, that the combination of Plassmann, Treuillet, Staller, and Kingslake teaches the limitations recited in claim 12. Pet. 63–67. Patent Owner’s Response does not separately address Petitioner’s arguments directed to this claim. PO Resp. 67.

Based on the evidence and arguments of record, we find that Petitioner demonstrates by a preponderance of the evidence that claim 12 would have been obvious to one of ordinary skill in the art over the combined teachings of Plassmann, Treuillet, Staller, and Kingslake.

VIII. ALLEGED OBVIOUSNESS OVER PLASSMANN,
TREUILLET, STALLER, AND PENG

A. *Legal Sufficiency of the Petition*

Patent Owner argues that the Petition is legally deficient because in a related district court litigation Petitioner argued that claims 21–23 contained terms subject to Section 112(f), but Petitioner here fails “to inform the Board that Petitioner contends these terms are subject to Section 112(f), or provide constructions or identify the specific portions of the specification describing the corresponding acts.” PO Resp. 67–68; PO Sur-reply 29–30. Patent Owner argues that Petitioner thereby violates 37 C.F.R. § 42.104(b). PO Resp. 67–68.

Patent Owner’s arguments are unpersuasive. In this *inter partes* review, Petitioner argues that express construction is not necessary for any claim term. Pet. 16. This is sufficient under our Rules. *See* CTPG 44 (“[A] petitioner may include a statement that the claim terms require no express construction.”). Patent Owner does not identify any requirement that

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Petitioner must take a claim construction position in this proceeding that is identical to a position taken in a still pending district court litigation. An inconsistency, however, can weigh against an argument on how to construe a claim term. Here, however, Patent Owner does not argue that Section 112(f) actually should apply to any claim term.

In addition, we do not find persuasive Patent Owner's reliance on *Orthopediatrics Corp. v. K2M, Inc.*, IPR2018-01548, Paper 9, at 9–12 (PTAB Mar. 1, 2019). This Board decision is non-precedential and we find that under the facts here. For example, in *Orthopediatrics Corp.*, the construction of the term was in dispute, which is not the situation here as neither party argues Section 112(f) applies. Paper 9, at 9. And the petitioner in *Orthopediatrics Corp.* argued, *inter alia*, that its “petition is based on the claim constructions urged by Patent Owner in the related district court litigation,” but failed to “set forth Patent Owner's position in the related [d]istrict [c]ourt litigation.” *Id.* at 9–10.

In sum, we do not find that the Petition in this proceeding is insufficient under 37 C.F.R. § 42.104(b).

B. Challenged Claims 21 and 22

Petitioner argues, with specific cites to the record, that the combination of Plassmann, Treuillet, Staller, and Peng teaches the limitations recited in claims 21 and 22. Pet. 67–77. Patent Owner's Response does not separately address Petitioner's arguments directed to these claims. PO Resp. 67.

Based on the evidence and arguments of record, we find that Petitioner demonstrates by a preponderance of the evidence that claims 21 and 22 would have been obvious to one of ordinary skill in the art over the combined teachings of Plassmann, Treuillet, Staller, and Peng.

C. Challenged Claim 23

Petitioner argues that the combination of Plassmann, Treuillet, Staller, and Peng renders claim 23 obvious. Pet. 78–79. Claim 23 depends from claim 15, which depends from independent claim 1. Ex. 1020, 13:23–34, 14:49–15:5. Claims 15 and 23 are reproduced below.

15. A method comprising using the stereophotogrammetry device according to claim 1, comprising:

moving the stereophotogrammetry device (1) and a target subject (S) (200) so that the positioning system (34) signals that one of the at least two pre-defined distance positions between the camera (1) and the target subject (S) is reached, such signal being the superimposition of beamers on the target subject (S) or the emission of an electromagnetic, acoustic or any other type of signal; and

taking one or several stereo-pairs at the same pre-defined distance position (300).

23. The method according to claim 15 comprising selecting (100):

Either the closer distance position (A4), and then placing a face of a target subject (S) at the closer distance position, and then taking several stereo-pairs of the face of the target subject (S) at the closer distance position, processing these stereo-pairs to reconstruct 3-Dimensional surfaces of the face of the target subject (S), then matching these different 3-Dimensional surfaces in space and finally stitching together these different 3-Dimensional surfaces into a comprehensive 3-Dimensional surface representation (710) of the face of the target subject (S); or

the farther distance position (A3), and then placing a torso of a target subject (S) at the farther distance position, and then taking several stereo-pairs of the torso of the target subject (S) at the farther distance position, processing these stereo-pairs to reconstruct 3-Dimensional surfaces of the torso of the target subject (S), then matching these different 3-Dimensional surfaces in space and finally stitching together these different 3-

Dimensional surfaces into a comprehensive 3-Dimensional surface representation (720) of the torso of the target subject (S).

Id.

For claim 23, Petitioner relies on, *inter alia*, its arguments it made for certain of the other challenged claims, such as for claims 1, 10, 11, and 15. Pet. 78–79.

Patent Owner argues that Petitioner fails “to prove that [one of ordinary skill in the art] would create a device having surfaces of fields of view capable of imaging both the face and torso as per claim 23.” PO Resp. 69–70 (footnote omitted) (citing PO Resp. 46–54; Ex. 2013 ¶ 228). Patent Owner relies on its arguments for claims 10 and 11 for support.

We are not persuaded by Patent Owner’s arguments. In particular, we address above the parties’ arguments directed to claims 10 and 11, and find that Petitioner shows that the combination of Plassmann, Treuillet, and Staller renders claims 10 and 11 obvious. *See supra* Sections VI(F)–(G). We also find above that Petitioner has shown that claims 1 and 15 are rendered obvious. *See supra* Sections VI(D)–(E).

Accordingly, based on the evidence and arguments of record, we find that Petitioner demonstrates by a preponderance of the evidence that claim 23 would have been obvious to one of ordinary skill in the art over the combined teachings of Plassmann, Treuillet, Staller, and Peng.

IX. PATENT OWNER’S MOTION TO EXCLUDE

Patent Owner’s Motion to Exclude seeks to exclude two areas of evidence. We address each in turn.

A. Exclusion of Dr. Otto's Testimony to the Extent it Espouses and Relies on Inadmissible Hearsay

Patent Owner argues that testimony of Petitioner's witness, Dr. Otto, should be excluded to the extent Dr. Otto relies on statements regarding the depth of field of the MAVIS II system discussed in Treuillet because Treuillet's statements are hearsay and not the kinds of fact an expert would reasonably rely upon. Mot. Excl. 1–13. Patent Owner further argues that Treuillet's description of MAVIS II is inconsistent with Plassmann's writings concerning MAVIS II and should be excluded for this reason as well. *Id.* at 13–14.

Patent Owner's arguments for exclusion are unpersuasive for at least three reasons. First, as Petitioner argues in opposition to the motion to exclude, Treuillet is admissible as prior art. Opp. Mot. Excl. 2–3. Petitioner and Dr. Otto rely on Treuillet for what the Treuillet reference teaches to a person having ordinary skill in the art at the relevant time. Treuillet's suggestions to a person having ordinary skill in the art remain relevant even if Treuillet were factually incorrect in some respects.

Second, even if considered hearsay, Dr. Otto properly relied on Treuillet. Opp. Mot. Excl. 4–7. Under Federal Rule of Evidence 703, an expert may rely on facts and data that “need not be admissible,” including hearsay (double or otherwise). Here, the evidence supports that Treuillet was published in an independent, respected, and peer-reviewed IEEE journal. *Id.* at 5–6 (citing evidence regarding reliability of the IEEE journal). In addition, we find unavailing Patent Owner's arguments concerning “Reference 45.”²⁴ Mot. Excl. 3–5; Reply Mot. Excl. 1–5.

²⁴ Treuillet cited this reference as follows: “MAVIS II: 3-D wound instrument measurement Univ. Glamorgan, 2006 [Online].

Rather, we find that it is appropriate for an expert also to rely on the sourcing in article published in such an IEEE journal. Thus, Treuillet is the kind of evidence we would expect an expert witness or person having ordinary skill in the art to rely upon, and Dr. Otto was entirely reasonable on relying on Treuillet in forming his opinions.

Third, even if Treuillet were inconsistent with other evidence, such as Plassmann, this issue would go to the credibility of Dr. Otto's testimony and the weight given to it in deciding ultimate issues of fact rather than admissibility in the first instance.

For the reasons above, we deny Patent Owner's motion to exclude with respect to Dr. Otto's testimony.

B. Exhibits 1018, 1019, 1026, 1033, and 1034

Patent Owner seeks to exclude Exhibits 1018, 1019, 1026, 1033, and 1034 because "the Petition does not cite or otherwise rely on them." Mot. Excl. 15. Petitioner argues that it relied on Exhibits 1026, 1033, and 1034. Opp. Mot. Excl. 12.

In rendering our decision, we only consider Petitioner's evidence to the extent it is properly presented in the Petition or the Reply. We consider Petitioner's evidence that Dr. Otto cites only to the extent explanation of the evidence is properly presented in the Petition or the Reply or only for purposes of assessing whether Dr. Otto's testimony presented in the Petition or the Reply is well-grounded. As such, resolution of Patent Owner's motion to exclude with respect to these exhibits would have no affect our decision making.

Available: <http://www.imaging.research.glam.ac.uk/projects/wm/mavis/>." Ex. 1016, 762.

For the reasons above, we dismiss as moot Patent Owner's motion to exclude these exhibits.

X. PATENT OWNER'S OBJECTIONS TO PETITIONER DEMONSTRATIVES

Patent Owner objects to certain of Petitioner's demonstratives for oral argument because, for example, the demonstratives constitute evidence that Petitioner did not reference or discuss in a prior paper, according to Patent Owner. *See, e.g.*, PO Objs. 2. Patent Owner also objects to certain demonstratives as mischaracterizing the record. *Id.* at 1.

Demonstratives for oral argument are not evidence, and we do not rely on demonstratives as evidence in our decision making. Paper 45, 3. Because demonstratives are not evidence and we do not rely on them in making our decision, Patent Owner's objections to the demonstratives likewise do not affect our decision making and are therefore moot.

XI. CONCLUSION²⁵

Based on the full record, we determine that Petitioner shows by a preponderance of the evidence that (i) claims 1–4, 8–11, 15, 16, and 20 are unpatentable over Plassmann, Treuillet, and Staller; (ii) claim 12 is unpatentable over Plassmann, Treuillet, Staller, and Kingslake; and

²⁵ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

(iii) claims 21–23 are unpatentable over Plassmann, Treuillet, Staller, and Peng.

Claim(s)	35 U.S.C. §	Reference(s) /Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–4, 8–11, 15, 16, 20	103	Plassmann, Treuillet, Staller	1–4, 8–11, 15, 16, 20	
12	103	Plassmann, Treuillet, Staller, Kingslake	12	
21–23	103	Plassmann, Treuillet, Staller, Peng	21–23	
Overall Outcome			1–4, 8–12, 15, 16, 20–23	

XII. ORDER

In consideration of the foregoing, it is hereby

ORDERED that, pursuant to 35 U.S.C. § 314(a), Petitioner has shown by a preponderance of the evidence that claims 1–4, 8–12, 15, 16, and 20–23 of the '253 patent are unpatentable;

FURTHER ORDERED that Patent Owner's Motion to Exclude (Paper 46) is *denied* with respect to evidence addressed by Section IX.A, *supra*, and is *dismissed as moot* with respect to evidence addressed by Section IX.B, *supra*;

FURTHER ORDERED that Patent Owner's Objections to Petitioner's Demonstratives are *overruled*; and

FURTHER ORDERED that parties to the proceeding seeking judicial review of this Final Written Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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Paper 60
Date: March 17, 2023

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CANFIELD SCIENTIFIC, INC.,
Petitioner,

v.

QUANTIFICARE S.A.,
Patent Owner.

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Patent 10,681,334 B2

Before BRIAN J. McNAMARA, JOHN D. HARMANN, and
BRIAN D. RANGE, *Administrative Patent Judges*.

McNAMARA, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
Denying In Part and Dismissing In Part Patent Owner's Motion to Exclude
35 U.S.C. § 318(a)

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Patent 10,681,334 B2

I. BACKGROUND

On March 21, 2022 we instituted an *inter partes* review of claims 1–5, 9–12, 15, 16, and 20–23 of U. S. Patent No. 10,681,334 B2 (“the ’334 Patent”), from a Petition (Paper 1, “Pet.”) filed September 8, 2021. Paper 15 (“Dec. to Inst.”). Patent Owner filed a Patent Owner Response (Paper 20, “PO Resp.”), Petitioner filed a Petitioner Reply (Paper 29, “Reply”) and Patent Owner filed a Sur-reply (Paper 41, “Sur-reply”). Patent Owner also filed a Motion to Exclude (Paper 45, “Mot. to Excl.”), Petitioner filed an Opposition to Patent Owner’s Motion to Exclude (Paper 46, “Opp. Mot. Excl.”) and Patent Owner filed a Reply to Petitioner’s Opposition (Paper 52, “PO Reply to Opp.”). A transcript of an oral hearing held on December 14, 2022 (Paper 59, “H’rg. Tr.”) has been entered into the record.

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. §318(a). We base our decision on the preponderance of the evidence. 35 U.S.C. § 316(e) (2018); 37 C.F.R. § 42.1(d).

Having reviewed the arguments of the parties and the supporting evidence, we conclude that Petitioner has demonstrated by a preponderance of the evidence that all the challenged claims are unpatentable.

II. THE ’334 PATENT

The ’334 patent is titled “Device and Method to Reconstruct Face and Body in 3D.” Ex. 1022, code (54). The challenged patent relates to a stereophotogrammetry device used “to picture and reconstruct in 3D the surface of objects of different sizes,” e.g., different body parts such as the face and the torso. *Id.* at 3:42–43; *see id.* at 1:30–42, 1:60–67. By way of background, the ’334 patent explains that “[s]tereophotogrammetry consists in [simultaneously] gathering the images of a subject from at least two view

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with a calibrated camera,” i.e., a “stereo-pair.” *Id.* at 1:43–48. The stereo-pair is used to “reconstruct . . . a dense representation in 3-Dimensions of the surface of the observed object.” *Id.* at 1:49–51. The ’334 patent states that “the device and method according to the disclosure are specifically intended to acquire with a single portable stereophotogrammetry camera views of subjects at two distinct distances” for “reconstruction in 3D of comprehensive representation of the head on one side of the subject and of the torso on the other side of the subject” to meet the “needs of plastic surgeons and aesthetic dermatologists with a single and portable imaging device.” *Id.* at 11:43–50.

Figures 1 and 2, reproduced below, respectively show side- and top-views of an “implementation” of a stereophotogrammetry device and its components. *Id.* at 3:66–4:2.

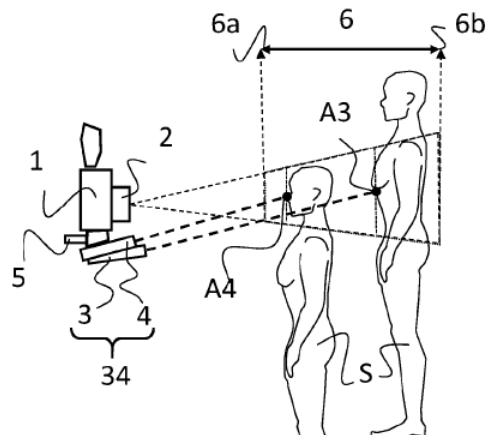


FIG. 1

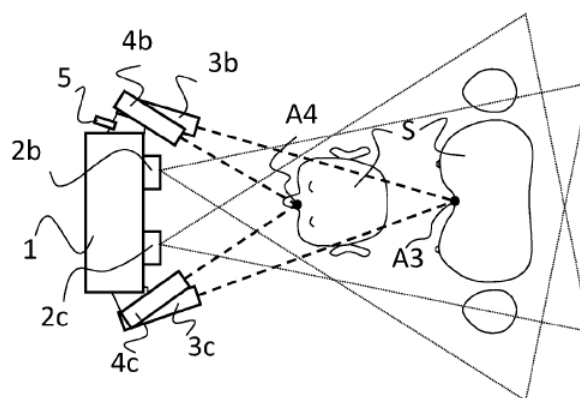


FIG. 2

In Figures 1 and 2, camera body (1) includes double optics (2). *Id.* at 8:43–44. As shown in Figure 2, double optics (2) are “composed of two sub-optics (2b) and (2c), enabling the acquisition of a stereo[-]pair [of images] corresponding to two slightly different viewing angles” simultaneously. *Id.* at 8:45–48; *see id.* at 3:28–31. For example, Figure 8 shown below shows a

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series of stereo-pair images taken at different angles for a face. *Id.* at 11:22–30.

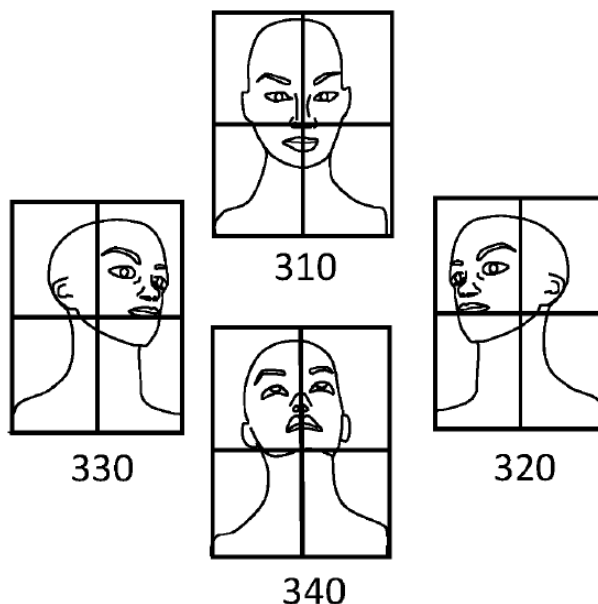


FIG. 8

The '334 patent specification describes Figure 8 as presenting “viewpoints optimized for imaging a face using a field of view close to an A4 surface format.” *Id.* at 4:17–18. Using the captured stereo-pairs, “a comprehensive representation in 3D of the surface of the subject (S)” can be constructed. *Id.* at 10:57–58.

Further, the stereophotogrammetry device captures stereo-pairs of images at “two distinct distances for picture taking corresponding respectively to position (A3) and (A4)” such that the stereo-pairs of images are in focus at positions A3 and A4, which are within the device’s depth of field 6. *Id.* at 8:48–59; *see id.* at 6:41–44. For example, position A3 is used for capturing images of the torso while position A4 is used for capturing images of the face. *Id.* at 6:22–30; *see id.* at 1:60–67. Positions A3 and A4 can be identified by the convergence of respective light patterns projected

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onto the subject to be imaged, the respective light patterns converging at the distances for positions A3 and A4—for example, as shown in Figure 2, a light pattern emitted by first pair of light beamers (3b) and (3c) converge at point (A3) and a different light pattern emitted by second pair of light beamers (4b) and (4c) converge at point (A4). *Id.* at 8:60–64; *see id.* at 4:64–5:3. Accordingly, “by placing the subject so that the light patterns projected by a first pair of beamers are superposed on the surface of the subject[,], one is placing the subject at” the first pre-defined position (and similarly for the light pattern emitted by the second pair of beamers converging at the second position). *Id.* at 4:67–5:2; *see id.* at 5:3–10.

Figure 8 illustrates that for the stereo pairs acquired at distance A4 for the face of subject S, it is advantageous to take a first view 310 from the front of the face, a second view 320 from the side of the face, a third view 330 from the other side and slightly under the face, and a fourth view from the front and slightly under the face. *Id.* at 11:23–20. Figure 9 illustrates a similar approach for acquiring images of a torso at distance A4. *Id.* at 11:31–42.

III. ILLUSTRATIVE CLAIM

Claim 1 is representative of the subject matter claimed in the '334 patent. Claim 1 is reproduced below using paragraph designations from the Petition.

1. [1.01] A device for stereophotogrammetry configured for an acquisition of two views according to two different angles, said acquisition generating a pair of images, with one image corresponding to one of the two views and the other image corresponding to the other of the two views, this pair of images being referred to as a stereo-pair,

[1.02] wherein the device is further comprising a positioning system (34) configured to signal when a target subject (S) is

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reaching one of at least two distinct pre-defined distance positions (A3, A4) relative to the stereophotogrammetry device, the at least two distinct predefined distance positions comprising a closer distance position (A4) and a farther distance position (A3), the closer distance position (A4) corresponding to the target subject (S) being closer to the stereophotogrammetry device and the farther distance position (A3) corresponding to the target subject (S) being farther to the stereophotogrammetry device.

IV. GROUNDS OF INSTITUTION

We instituted trial on the following all ground asserted in the Petition, in particular:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–5, 9–12, 15, 16, 20	103	Plassmann ¹ , Treuillet ² , Staller ³
21–23	103	Plassmann, Treuillet, Staller, Peng ⁴

V. CLAIM CONSTRUCTION

Petitioner submits that no express constructions are required to evaluate the issues raised in the Petition, except for the following terms:

(1) *device for stereophotogrammetry configured for an acquisition of two views according to two different angles* and (2) *a positioning system*

¹ WO 2010/097572 A2, *Method and Apparatus for Stereoscopic Imaging and Adaptor Therefor*, published September 2, 2010 (Ex. 1007).

² S. Treuillet, B. Albouy and Y. Lucas, *Three-Dimensional Assessment of Skin Wounds Using a Standard Digital Camera*, IEEE Transactions on Medical Imaging, vol. 28, no. 5, pp. 752–762, May 2009 (Ex. 1016).

³ U.S. Patent No. 7,257,322, *Photographic Strobe Diffuser*, issued August 14, 2007 (Ex. 1006).

⁴ Qi Peng, Lifen Tu, Kaibing Zhang, Sidong Zhong, *Automated 3D Scenes Reconstruction Using Multiple Stereo Pairs from Portable Four-Camera Photographic Measurement System*, International Journal of Optics Volume 2015 (August 17, 2015) (Ex. 1009).

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configured to signal when a target subject (S) is reaching one of at least two distinct pre-defined distance positions (A3, A4) relative to the stereophotogrammetry device. Pet. 15–20.

A. *Positioning system configured to signal when a target subject (S) is reaching one of at least two distinct pre-defined distance positions (A3, A4) relative to the stereophotogrammetry device*

In our Decision to Institute, we noted that both parties agree that this term reciting a positioning system should be construed as a means plus function limitation subject to the provisions of 35 U.S.C. § 112(f). Dec. to Inst. 12–13. We adopted Petitioner’s proposal that “[t]he recited function is signaling when a target subject is reaching one of at least two distinct pre-defined distance positions relative to the stereophotogrammetry device” and a person of ordinary skill “would not recognize the phrase to refer to any specific structure.” *Id.* (citing Pet. 19) (alteration in original). Petitioner also states that “[i]f signaling includes the superimposition of two light beams on the subject, then the specification identifies structure including at least two pairs of light beamers for performing that function.” Pet. 19 (citing Ex. 1022, 4:64–5:7). Patent Owner does not dispute Petitioner’s proposed construction, and the proposed construction is consistent with claim language and the ’334 Specification. Thus, we apply this construction for purposes of this Decision.

B. *device for stereophotogrammetry configured for an acquisition of two views according to two different angles*

1. *Introduction*

Challenged independent apparatus claim 1 and dependent apparatus claims 2–5 and 9–12 recite a “device for stereophotogrammetry.” Apparatus claim 3 depends from claim 1 and further limits the device to a portable system. Ex. 1022, 12:10–11. No apparatus claim depends directly or

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indirectly from claim 3. Challenged method claims 15–16, 20 recite methods of using the device recited in claim 1 (*see* claim 15), claim 5 (*see* claim 16), and claim 9 (*see* claim 20). Claims 21 and 23 depend from method claim 15. “[T]he presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim.”); *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 910 (Fed. Cir. 2004). Thus, none of the claims, except claim 3, is limited to a device for stereophotogrammetry that is portable.

In the Decision to Institute, we declined to construe this term as a means plus function term under 35 U.S.C § 112(f). Dec. to Inst. 9–12. Although Petitioner disagrees and asserts that the term “device for stereophotogrammetry” should be construed under 35 U.S.C. § 112(f), Petitioner presents no arguments other than those in the Petition that we addressed in the Decision to Institute. Reply 7–8. Petitioner further acknowledges that “an express construction may not be necessary for the Board to evaluate patentability.” *Id.* at 8. For the reasons discussed in the Decision to Institute, we do not construe *device for stereophotogrammetry configured for an acquisition of two views according to two different angles* as a means plus function term under 35 U.S.C. § 112(f).

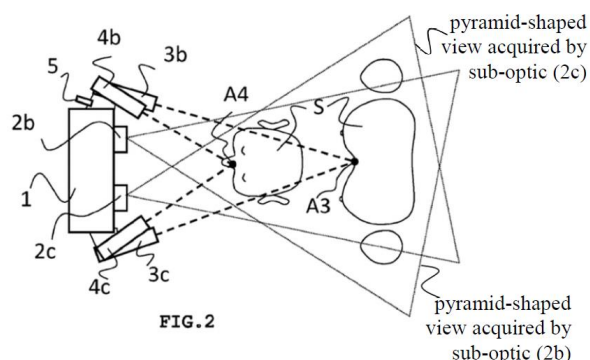
Our Decision to Institute applied the plain and ordinary meaning to this term without any express construction to the remaining language of this limitation, including “configured for an acquisition of two views according to two different angles.” Dec. to Inst. 9–11. In the context of the challenged claims, the parties dispute the implications of the plain and ordinary meaning.

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Patent Owner asserts that “configured for an acquisition of two views” requires acquiring the two views from spaced viewpoints, i.e., that the sub-optics be spaced. PO Resp. 1–6. Patent Owner also argues that we must further construe the term to mean the device must be configured to acquire the two views at two different angles, where “two different angles” means that the views are acquired by sub-optics having a different angle of “optical axis.” *Id.* at 5–25. Noting Patent Owner’s citation of Figure 2 of the ’334 patent as a possible implementation of the device, Petitioner contends that Patent Owner incorrectly asserts the claims require each axis of each of the sub-optics be angled inwards. Reply 1 (citing PO Resp. 6–7; Ex. 1053, Supplemental Declaration of Gerhardt Paul Otto, Ph.D. (“Supp. Otto Decl.”) ¶¶ 9–10). According to Petitioner, the plain language of the limitation “two views according to two different angles” does not recite that the sub-optics are angled, but only that the sub-optics view the subject from different angles. *Id.*

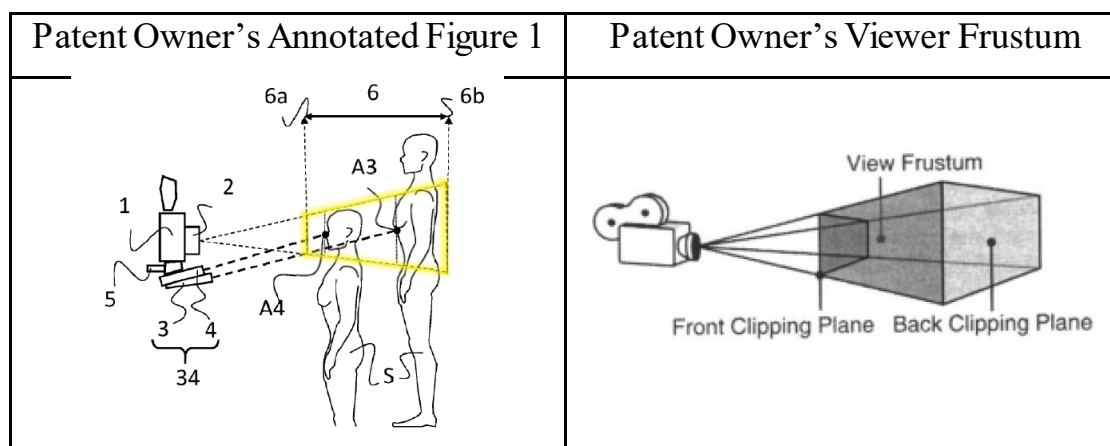
Noting that a viewpoint is the position from which a scene is observed or photographed, Patent Owner argues that the claimed “two views” requires two photographs with the optics so spaced as to acquire two views from different viewpoints. PO Resp. 1 (citing Ex. 2018, Declaration of Dr. Daniel van der Weide (“van der Weide Decl.”) ¶¶ 33–35, 57, 58; Ex. 2019, 188). According to Patent Owner, each view is a pyramid shaped view frustum. *Id.* at 2–4 (citing Ex. 1022, 10:3–14 for the proposition that each view is a “pyramid of the view taking corresponding to sub-optics (2b) or (2c)”); Ex. 2018, van der Weide Decl. ¶¶ 51, 52, 59). Reproduced below is one of Patent Owner’s annotated versions of Figure 2 of the ’334 patent.

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Id. at 3.

Below on the left is Patent Owner's annotated version of Figure 1 of the '334 patent; on the right is Patent Owner's illustration of a view/viewing frustum.



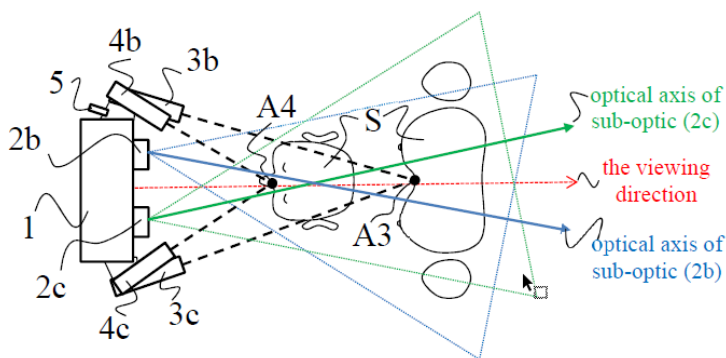
Id. at 3, 4. Patent Owner characterizes the viewing frustum on the right as a flat top pyramid that encompasses the volume of space recorded by a camera having a “front clipping plane” defined by the closest object visible to the camera and a “back clipping plane” defined by the farthest object visible to the camera. *Id.* at 4. Patent Owner identifies the highlighted portion of Figure 1 as the “pyramid of view taking” that defines a frustum shaped volume within which each sub-optic acquires its view. *Id.* at 3. Patent Owner does not identify any discussion in the '334 patent of a pyramid of view taking that “defines a frustum shaped volume.” According to Patent

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Owner, an ordinarily skilled artisan would understand that Figure 1 is a side view of the intersecting flat-top pyramids that encompass the volume of space recorded by double optics 2, where 6A is the front clipping plane (the plane closest to the stereophotogrammetry device and for which the images start to be focused) and 6B is the back clipping plane (the plane farthest from the stereophotogrammetry device and for which the images are no more in focus). *Id.* at 4–5 (citing Ex. 1022, 8:55–59; Ex. 2018, van der Weide Decl. ¶¶ 62–63); Dr. van der Weide also states that three dimensional reconstruction of a subject can be obtained only where the two pyramid-shaped view frustums intersect (stating that in Figure 1 the field of view of closer point position A4 is defined by the intersection of the pyramid of the view taking corresponding to sub-optics (2b) or (2c) with the plane perpendicular to the viewing direction and including point A4, and the field of view of at the farther point position A3 is defined by the intersection of the pyramid of the view taking corresponding to sub-optics (2b) or (2c) with the plane perpendicular to the viewing direction and including point A3). *See* Ex. 2018, van der Weide Decl. ¶ 78–79.

Reproduced below is another annotated version of Figure 2 of the '334 patent provided by Patent Owner.



PO Resp. 18. Figure 2 represents a “possible implementation” of the '334 patent’s device viewed from the top. Ex. 1022, 4:1–2. Patent Owner

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annotates Figure 2 by coloring the light pyramid extending from sub-optic 2b in blue and coloring the light pyramid extending from sub-optic 2c in green. PO Resp. 17–18 (citing Ex. 2018, van der Weide Decl. ¶ 93). Patent Owner also adds a solid blue line and solid green line at the center of each sub-optic to illustrate the “optical axis” of the sub-optic. *Id.* Patent Owner does not identify any corresponding discussion in the Specification.

Petitioner contends that the claim language does not require that the sub-optics be angled, but instead only requires that the sub-optics “view” the subject from different angles. Reply 1–7. Patent Owner contends that the claim language does not mention light from the subject object be imaged, or the angles at which light is received from different points on the object. PO Resp. 19. According to Patent Owner, “[r]ather the ‘two different angles’ limitation defines an intrinsic feature of the device, i.e. how it is configured.” *Id.* (citing Ex. 2018, van der Weide Decl. ¶ 100).

Having considered the claim language, the specification, the prosecution history, and the extrinsic evidence, for the reasons discussed below, we conclude that the claim language does not mean that the sub-optics are angled, but instead means that they each view a subject from different angles.

2. *Analysis*

a) *The claim language*

The relevant language of claim 1 recites “[a] device for stereophotogrammetry configured for an *acquisition of two views according to two different angles*.” Ex. 1022, claim 1 (emphasis added). The recitation “according to two different angles” immediately following the recitation “acquisition of two views” suggests that the recited “two different angles” concerns the views themselves. Recognizing that claim 1 recites the device

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is “configured to” acquire these views, however, we further analyze the claim language. *See* PO Resp. 1, 19 (“the ‘two different angles’ limitation defines an intrinsic characteristic of the device, i.e., how it is ‘configured.’”).

We understand the parties to argue that, based on plain language, the claimed two sub-optics must be configured (i.e., physically orientated) in a manner that makes them capable of acquiring “two views according to two different angles.” As discussed further herein, Petitioner’s arguments emphasize whether the view of the subject is from two different angles; Patent Owner’s arguments emphasize whether the optical axes of the sub-optics are at two different angles. Petitioner points out that “PO asserts the challenged claims require the axis of each set of sub-optics to be angled inwards.” Reply 1. Patent Owner argues “[a] POSITA would understand that each (i) ‘optical path’ in Fig. 6 extends along the optical axis of the sub-optic, and (ii) optical axis is located at the center of the view frustum acquired by the sub-optic and is the axis of the view.” PO Resp. 16–17 (citing Ex. 2018, van der Weide Decl. ¶¶ 89, 94–96).

Patent Owner contends “the ‘subject’ is claimed only in connection with the ‘positioning system (34)’ ‘configured to signal when a target subject (S) is reaching[] . . . pre-defined distance positions (A3, A4) of the target subject (S) relative to the camera body (1).” *Id.* at 19. This claim language limits the device to one that “is further comprising” a positioning system “configured to signal when a target subject (S) is reaching one of two pre-defined distance positions (A3, A4) relative to the photogrammetry device.” Ex. 1022, 11:60–63.

Patent Owner’s argument that this language further limits the axes of the sub-optics is unavailing. As discussed above, Patent Owner contends that “configured for an acquisition of two views” requires acquiring the

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views from spaced viewpoints. PO Resp. 1. Patent Owner’s discussion of the frustum or the pyramid of the view taking in Figure 2 of the ’334 patent does not address the broad claim language reciting that the acquisition generates a pair of images, one for each of the two views. Ex. 1022, 11:54–59 (claim 1), *see* Section V.A.1 herein. The claim language merely requires two views—it does not require that the two views be taken by sub-optics with optical axes that are not parallel or point inward. The claimed “views” refer to viewed subject material (e.g., a desired target subject or merely whatever exists at the viewing plane).

For similar reasons, we also find unavailing Patent Owner’s argument that the claims “disclose configuring the sub-optics according to ‘two different angles’ as a prerequisite to ‘pre-defining’ the ‘positions (A3, A4) of the target subject (S),’ as further claimed, and locating the subject at such positions within the two views.” PO Resp. 19–20 (citing Ex. 2018, van der Weide Decl. ¶ 103); *see also id.* at 20 (arguing that dependent claims drawn to locating a target subject at the predefined distance before taking stereo-pairs at the same predefined distance position also supports this argument). We likewise find unavailing Patent Owner’s argument that “the ‘two different angles’ limitation has nothing to do with the angles at which the sub-optics receive light from a subject, but rather defines the space within which the subject must be located to be imaged in the first place.” *Id.* at 20 (citing Ex. 2018, van der Weide Decl. ¶ 100); Sur-reply 2. These arguments are inapposite, and do not preclude the claimed sub-optics from being parallel, as Patent Owner argues. Rather, Patent Owner acknowledges, conventional stereophotogrammetry devices can include parallel sub-optics “configured (spaced) to acquire two views,” and provide a stereoscopic binocular area where “the parallel views intersect to form

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stereo-pairs that can be reconstructed into three-dimensional representations.” PO Resp. 5–6; Ex. 2018, van der Weide Decl. ¶ 67; Ex. 2020,⁵ 90. Hence, the target subject S can be located at distances within that stereoscopic binocular area, which is consistent with Patent Owner’s argument that the limitation “defines the space within which the subject must be located to be imaged in the first place.” Ex. 2020, 90; PO Resp. 6, 20–21.

According to Patent Owner, Petitioner’s argument that images acquired by mirrors spaced apart acquires two views “necessarily taken at different angles” improperly reads the “two different angles” limitation out of claim 1. PO Resp. 7–8 (citing Pet. 32 (Petitioner’s discussion of Plassmann)), 22 (arguing that “[s]uch a construction is inconsistent with the plain language of the claims and written description and would render the limitation meaningless.”); Sur-reply 5–6. Patent Owner further argues that Petitioner “reads ‘the subject’ [of the stereophotogrammetry] into the claim to argue that ‘two different angles’ refers to ‘the different angles from each of the sub-optics to the subject.’” Sur-reply 5. Claim 1 explicitly recites “said acquisition generating a pair of images with one image corresponding to one of the two views and the other image corresponding to the other of the two views.” Ex. 1022, 11:56–58 (claim 1). As discussed above, we agree with Petitioner and conclude that acquiring views “according to two different angles” relates to acquiring images of a subject. We also agree with Petitioner and conclude that claim 1 does not otherwise limit how the two sub-optics are displaced, e.g., to exclude a conventional stereophotogrammetry device, that can acquire views of a subject from

⁵ Richard W. Kroon, *3D A-to-Z, An Encyclopedic Dictionary* (2012).

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different angles. *Id.* at 11:43–58; Reply 7 (citing Ex. 1053, Supp. Otto Decl. ¶ 31 (“[t]he claim does not recite ‘displacing the sub-optics’ other than by means of its reference to acquiring views ‘according to two different angles’”).

We also agree with Petitioner that “the preamble here is not limiting, because the body of the claim provides a complete description of the device.” Reply 6–7 (citing *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997)). The preamble for claim 1 recites “[a] device for stereophotogrammetry,” but “[g]enerally, the preamble does not limit the claims.” Ex. 1022, 11:42; *Georgetown Rail Equip. Co. v. Holland L.P.*, 867 F.3d 1229, 1236 (Fed. Cir. 2017). Regardless, as Petitioner notes, no “canon of claim construction is absolute in its application and [] some surplusage may exist in some claims.” Reply 7 (alteration in original) (quoting *Decisioning.com, Inc. v. Federated Dep’t Stores, Inc.*, 527 F.3d 1300, 1312 n.6 (Fed. Cir. 2008) (acknowledging that proper construction of “remote interface” arguably “render[s] the term ‘public’ in [a dependent claim] surplusage”)).

b) The Specification

Figures 2 through 5 of the ’334 patent illustrate pyramid-shaped views acquired by the sub-optics where the pyramids are inwardly angled (rather than being perpendicular to the device’s plane). Ex. 1022, Figs. 2–5, 10:3–15 (discussing the pyramid of the view taking corresponding to sub-optics (2b) or (2c) with the plane perpendicular to viewing directions including close distance point A4 and farthest distant point A3). The Specification indicates that all of these figures illustrate *possible* or *exemplary* implementations. *See, e.g., id.* at 3:59–4:5 (stating that Figures 1, 2 and 3 each illustrate a “possible implementation”), 9:47–48 (stating that Figure 4 is

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an “exemplary device”), 9:55–56 (stating that Figure 5 is an “exemplary device”). Nevertheless, the claims do not limit the optical axes of the pyramids and the Specification does not discuss the optical axes of the pyramids as essential features of the claimed invention. To the contrary, the Specification provides that “[t]he double optics of the stereophotogrammetry device can be manufactured in different ways without impacting the functionality of the invention, provided that it is characterized by an increased depth of field.” *Id.* at 4:38–41.

Dr. Otto notes that the written description does not discuss optical axes or the frustums referenced by Dr. van der Weide. Ex. 1053, Supp. Otto Decl. ¶ 27. Rather than identify converging inwardly angled optical axes, the Specification repeatedly refers to different angles of the sub-optics relative to the viewed subject in a manner similar to the claims. *See, e.g.*, Ex. 1022, 4:28–30 (referring to “double optics enabling the acquisition of two simultaneous views with different angles of the subject”), 4:44–46 (referring to “double optics” using “secondary mirrors each receiving one image of the subject with a slightly different angle”). The Specification also acknowledges that “angle” could refer to “viewing angle,” thus suggesting that angle may merely refer to a different view. *Id.* at 3:47–49 (referring to “double optics enabling to simultaneously acquire at least two pictures according to two different viewing angles”), 8:44–47 (referring to “double-optics” with “two sub-optics (2*b*) and (2*c*), enabling the acquisition of a stereo pair corresponding to two slightly different viewing angles”).

The written description also refers to a series of stereo-pairs taken such that the “angle of the views are close the these [sic] presented in FIG. 9.” *Id.* at 11:33–34. We reproduce Figure 9 of the ’334 patent below.

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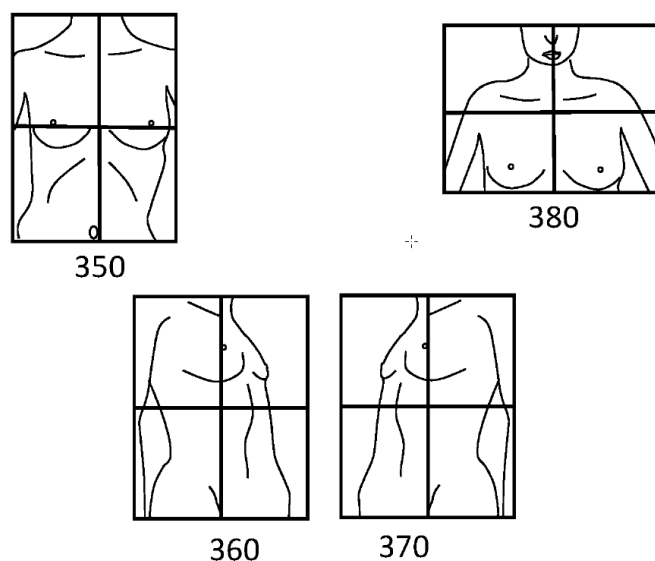
**FIG. 9**

Figure 9 “present[s] viewpoints optimized for imaging a torso using a field of view close to an A3 surface format.” *Id.* at 4:19–20. The “angle of the views,” in this context, refers to the angle the stereo-pairs are taken relative to the position of the subject. *Id.* at 11:30–42. Although the stereophotogrammetry device is moved between acquisition of each stereo-pair, the term “angle” in this context does not reference an optical axis, but rather is relative to the position of the subject. As the ’334 written description does not address an optical axis or define an angle of the sub-optics, it does not serve to limit or particularly define claim scope with regard to the optical axis.

We find unavailing Patent Owner’s arguments concerning problems described in the Background section of the Specification and the advantages of the ’334 patent. PO Resp. 9–15. For example, the ’334 patent discloses that portable stereophotogrammetry devices previously developed included “a single, nominal distance for picture taking which is optimized either for the face or for breast, but not optimized for both applications at the same

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time,” according to Patent Owner. *Id.* at 8–9 (quoting Ex. 1022, 3:16–20; citing Ex. 2018, van der Weide Decl. ¶ 73). Patent Owner argues that the ’334 patent “ties the ‘two different angles’ limitation to overcoming the problem in the prior art and achieving the advantage of the invention” (i.e., a single stereophotogrammetry device for both distances). *Id.* at 9–10 (citing Ex. 1022, 3:56–61); *see also id.* at 10 (citing Ex. 1022, 4:43–46, 8:44–47; Ex. 2018, van der Weide Decl. ¶ 76) (making same argument).

According to Patent Owner, however, if the sub-optics are configured for parallel views, the field of view at point (A4) in Figure 2 “is too small to image the face and would not achieve the ‘advantage of the invention,’ *i.e.*, ‘a single portable stereophotogrammetry system . . . enabling the 3D reconstruction of the head . . . and . . . torso.’” *Id.* at 15 (quoting Ex. 1022, 8:28–35; citing Ex. 2018, van der Weide Decl. ¶¶ 56, 87) (alterations in original). This argument is unavailing. We agree with Petitioner that “[s]imply moving the subject further from the camera would place the face” within the view pyramids. *See* Reply 3–4; Ex. 1053, Supp. Otto Decl. ¶ 24. As can be seen for the version of Figure 2 modified by Patent Owner to show parallel view pyramids, a sufficient field of view for the face and torso is within the binocular area if the subject is moved further from the camera. *See* PO Resp. 14 (modifying Ex. 1022, Fig. 2); *see also* Ex. 1053, Supp. Otto Decl. ¶ 29 (testifying that moving further away “[i]f no other changes were made, . . . would slightly lower the 3D resolution of the surface captured by the device compared to using angled frustums,” “[h]owever, in this application area a slight decrease in resolution is acceptable”).

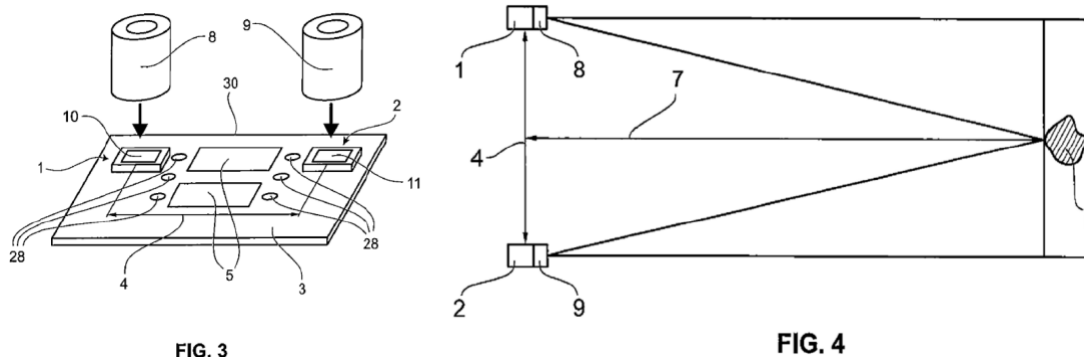
In sum, we find that the ’334 Specification does not address optical axes, and does not serve to limit the plain and ordinary meaning of this limitation so as to exclude parallel sub-optics.

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c) The prosecution history

We next turn to the patent prosecution history. The '334 patent is a continuation of U.S. Patent No. 10,070,119 B2 (“the ’119 patent”). *See* Ex. 1022, code (63). Prosecution history “can often inform the meaning of the claim language by demonstrating how the inventor understood the invention.” *Phillips*, 415 F.3d at 1317. The prosecution history of the ’119 patent is relevant to the claim construction issues before us. *See* Ex. 1002.

In particular, Patent Owner treated the “according to two different angles” language differently during prosecution of the ’119 patent than it does now. During prosecution, the Examiner rejected the challenged claims over Hoffmeier⁶ and concluded that Hoffmeier disclosed a stereophotogrammetry device comprising “two sub-optics (2b) and (2c) configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1002, 63–66; Ex. 1053, Supp. Otto Decl. ¶ 12. Figures 3 and 4 of Hoffmeier are reproduced below side by side (Figure 3 is on the left and Figure 4 is on the right).



Ex. 1005, Figs. 3, 4. Hoffmeier Figure 3 depicts the Hoffmeier device.

Ex. 1053, Supp. Otto Decl. ¶ 13. Hoffmeier Figure 3 is a perspective view

⁶ US 2011/0175987 A1, *Stereo Camera System*, published July 21, 2011 (Ex. 1005)

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of the Hoffmeier system. Ex. 1005 ¶ 25. Hoffmeier Figure 4 “shows the schematic structure of a stereo camera system according to Figs. 1 to 3” with image detection sensors 1, 2 arranged at a defined distance from each other and optical systems 8, 9 at a distance 7 from object 6 in front of the stereo camera system. *Id.* ¶ 37. Thus, Hoffmeier Figure 4 shows components 8, 9 each consisting of one or more lenses and/or further optical elements. Ex. 1053, Supp. Otto Decl. ¶ 14.

Hoffmeier describes lenses that face forward rather than at an angle. Ex. 1005, Figs. 3, 4, ¶ 35 (“The two optical systems 8, 9 can be coupled to the board 3 such that the respective optical axis of an optical system 8, 9 runs through the center point of the image sensing area 10, 11 of an image detection sensor 1, 2”); *see also* Ex. 1053, Supp. Otto Decl. ¶ 14 (Petitioner’s witness, Dr. Otto, opining that Hoffmeier Figure 4 “shows components 8 and 9 as having parallel axes”).

During prosecution Patent Owner submitted a statement of CEO and ’334 named patent inventor, Dr. Jean-Philippe Thirion, responding to the Examiner’s rejection over Hoffmeier. *See* Ex. 1002, 88. In that submission, Patent Owner acknowledged that Hoffmeier teaches claim 1’s “two different angles” recitation as follows:

Being devoid of any positioning system external to the stereovision system itself makes Hoffmeier quite different from the invention described in ’981 [(referencing the ’981 application that led to the ’119 patent)]. Hoffmeier therefore discloses “A device for stereophotogrammetry comprising a camera body (1) and a double-optics (2) comprising two sub-optics (2b) and (2c), configured for a simultaneous acquisition of two views **according to two different angles**” as in claim 1 of ’981, but it is all that Hoffmeier discloses relative to claim 1 of ’981.

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Ex. 1002, 92 (*italic emphasis omitted, bold emphasis added*). Patent Owner further admitted that “8 and 9 in FIG 3 of Hoffmeier exactly correspond to 2b and 2c i[n] FIG. 2 of [the ’334 patent].” *Id.* at 91–92.

Patent Owner’s admissions during prosecution indicates to the public that Patent Owner understood that spaced optics with parallel optical axes may, nonetheless, fall within the scope of claim 1 of the ’334 patent. Patent Owner now downplays these admissions by arguing that Hoffmeier “is ambiguous as to whether the optical axes of 8, 9 are angled inwards, or are parallel.” Sur-reply 7. Patent Owner’s ambiguity arguments are unavailing. Patent Owner cannot now assert that “the plain and ordinary meaning discerned from the claims and specification” (*id.*) is different from the meaning Patent Owner acknowledged during prosecution of the ’119 patent. Even if the term were ambiguous, Patent Owner admitted in the prosecution record that, for purposes of claim construction, Hoffmeier taught the claimed limitation “two views according to two different angles.” Ex. 1002, 92. The prosecution history, thus, suggests that Hoffmeier’s optical axes orientation is not important to whether the “two different angles” recitation is met. As such, Patent Owner’s prosecution history statement aligns with the present arguments of Petitioner, not Patent Owner.

d) Extrinsic evidence

Although less critical than the prosecution history, extrinsic evidence⁷ also supports Petitioner’s claim construction position. During district court litigation involving the ’119 patent, Patent Owner responded to Petitioner’s

⁷ Patent Owner also argues that a technical dictionary supports that views are pyramid-shaped frustums with an optical axis. PO Resp. 4–6, 16–17. We address Patent Owner’s discussion of this subject matter in the Introduction above. *See* Section V.B.1 herein.

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invalidity allegations regarding the Plassmann reference by agreeing that Plassmann teaches the now disputed “according to two different angles” language, stating QuantifiCare agrees that the quoted language and figure include, *inter alia*, a double-optics comprising two sub-optics configured for a simultaneous acquisition of two views according to two different angles.” Ex. 1037, 2; *see also* Reply 5–6. Patent Owner now disputes that Plassmann teaches this recitation. *See, e.g.*, PO Resp. 27 (arguing that “[Petitioner’s] contention that Plassmann acquires ‘two views according to two different angles’ is incorrect”) (emphasis omitted). Thus, Patent Owner’s position in the District Court litigation was consistent with its position during prosecution, but inconsistent with its position in the current proceeding.⁸ This inconsistency at least somewhat weighs against Patent Owner’s claim construction arguments.

e) Claim construction conclusion

Having considered the evidence of record, including the language of the claims, the specification, the prosecution history, and the extrinsic evidence, as well as the argument put forth by the parties, we find that the preponderance of the evidence supports a construction that claim 1’s “two views according to two different angles” language does not require that the optical axis of each sub-optic be angled, but instead requires only that the sub-optics view the subject from different angles.

⁸ Patent Owner argues that this extrinsic evidence should be disregarded. Sur-reply 8–9. We disagree. While the extrinsic evidence is entitled to less weight, it nonetheless bolsters the intrinsic evidence establishing that Patent Owner—outside of the instant proceeding—understood “two views according to two different angles” in accordance with Petitioner’s claim construction.

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VI. ANALYSIS OF PRIOR ART CHALLENGES

A. Introduction

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. See *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Additionally, the obviousness inquiry typically requires an analysis of “whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”)); see *In re Warsaw Orthopedic, Inc.*, 832 F.3d 1327, 1333 (Fed. Cir. 2016) (citing *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d 1356, 1360 (Fed. Cir. 2006)).

An obviousness analysis “need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court

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can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR*, 550 U.S. at 418; *accord In re Translogic Tech., Inc.*, 504 F.3d 1249, 1259 (Fed. Cir. 2007). Petitioner cannot satisfy its burden of proving obviousness by employing “mere conclusory statements.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016). Instead, Petitioner must articulate a reason why a person of ordinary skill in the art would have combined the prior art references. *In re NuVasive*, 842 F.3d 1376, 1382 (Fed. Cir. 2016).

A reason to combine or modify the prior art may be found explicitly or implicitly in market forces; design incentives; the “interrelated teachings of multiple patents”; “any need or problem known in the field of endeavor at the time of invention and addressed by the patent”; and the background knowledge, creativity, and common sense of the person of ordinary skill. *Perfect Web Techs., Inc. v. InfoUSA, Inc.*, 587 F.3d 1324, 1328–29 (Fed. Cir. 2009) (quoting *KSR*, 550 U.S. at 418–21).

As part of determining whether a claim is obvious in light of the prior art, we consider any relevant evidence of secondary considerations of non-obviousness. *See Graham*, 383 U.S. at 17. Notwithstanding what the teachings of the prior art would have suggested to one of ordinary skill in the art at the time of the invention, the totality of the evidence submitted, including objective evidence of non-obviousness, may lead to a conclusion that the challenged claims would not have been obvious to one of ordinary skill. *In re Piasecki*, 745 F.2d 1468, 1471–72 (Fed. Cir. 1984). Petitioner argues there are no secondary considerations applicable in this proceeding.

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Pet. 74–76.⁹ Patent Owner contends that secondary considerations demonstrate the claims recite patentable subject matter. PO Resp. 57–67; Sur-reply 25–30.

We analyze the asserted grounds of unpatentability in accordance with these principles to determine whether Petitioner has met its burden to establish by a preponderance of the evidence that the claims are unpatentable.

B. Plassmann

Plassmann is a World Intellectual Property Organization publication that relates to an apparatus for the production of stereoscopic images. Ex. 1007, codes (10), (19), (57). Plassmann describes variations of the “MAVIS” system. *Id.* at 11:25–12:29. Plassmann’s apparatus captures “two images [which are] needed to form a stereo image . . . to produce a three-dimensional representation of the subject.” *Id.* at 12:25–29. The apparatus further includes two light emitting diodes (LEDs) emitting respective beams which converge at a particular distance in front of the apparatus. *Id.* at 12:7–13.

Below, we reproduce Plassmann Figures 1A and 1B.

⁹ The last correctly numbered page of the Petition is page 73. The Petition incorrectly numbers subsequent pages, with page 74 unnumbered and pages 75–76 numbered pages 2 and 3.

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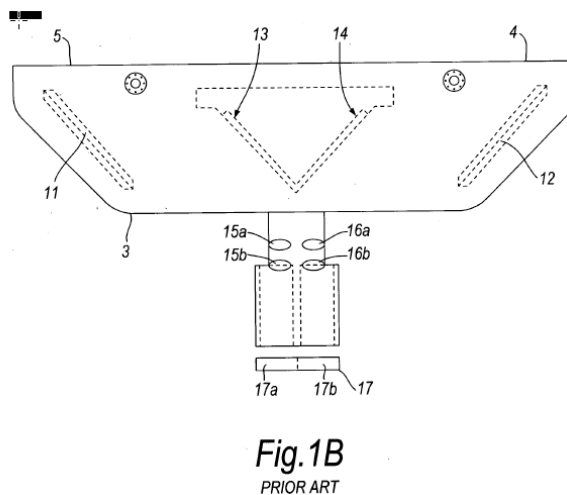
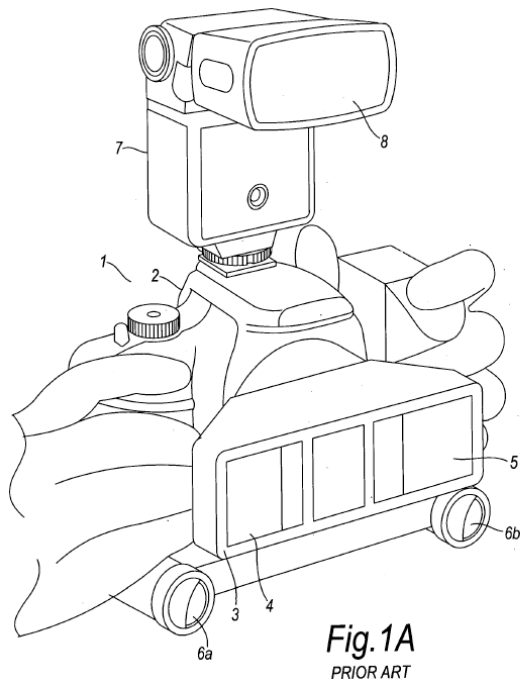


Figure 1A is a perspective representation of an apparatus for obtaining stereoscopic images, showing body 2, e.g., a camera, and adaptor 3. *Id.* at 11:3–4, 11:28–12:4. Further Figure 1B shows a “plan view” of adaptor 3 in further detail. *Id.* at 11:5–6, 12:13–14. Adaptor 3 has two apertures 4, 5 which respectively collect light that is respectively focused onto charge coupled device parts 17a, 17b, forming respective first and second images. *Id.* at 12:15–25. The first and second images form a stereo image used to produce a three-dimensional representation of a subject. *Id.* at 12:25–29. As shown in Figure 1A, Plassmann’s apparatus includes two low-powered light emitting diodes (LEDs) 6a, 6b, each provided with a [focusing] lens to produce a beam of light and being arranged so that the beams converge and meet at a point a fixed and desired distance from the apparatus, this distance corresponding to the distance at which the camera lens is [focused]. *Id.* at 12:8–13. The converging beams act as “a guide to show distance between the apparatus and subject.” *Id.* at 16:12–14.

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C. Trueillet

Treuillet is a paper that relates to an “approach to build 3-D models of skin wounds from color images.” Ex. 1016, 752. Treuillet explains that “[b]y taking two color images from different points of view, stereophotogrammetry allows the computation of the 3-D coordinates of numerous points on the skin lesion.” *Id.* at 754.

By way of imaging technology background, Treuillet describes the MAVIS II system as “a reflex digital camera equipped with special dual lens optics for recording two images from slightly different viewpoints, generating a stereo pair” which includes “two tube-shaped projectors produce beams of light which intersect in a single spot when the camera is held at the right distance” at “about 80 cm from the wound,” with a tolerance of plus or minus 15 cm. *Id.* at 755.

D. Staller

Staller is a U.S. patent that relates to a diffuser attachment for a camera including a “distance measurement device [that] uses a pair of light beams which intersect at a repeatable distance from the diffuser body to readily enable positioning of an object to be photographed at that repeatable distance.” Ex. 1006, codes (10), (12), (57).

Below, we reproduce Figure 2, which shows a front perspective view of a diffuser. *Id.* at 3:13–14.

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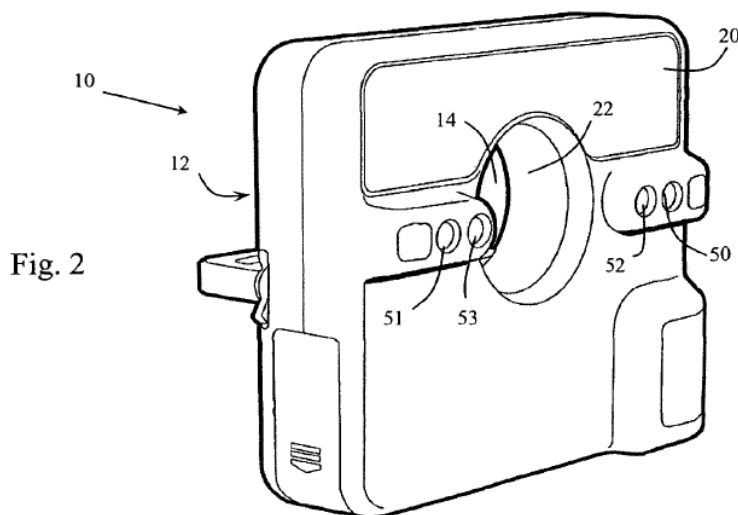


Fig. 2

As shown in Figure 2, the diffuser “includes a distance measurement device or indicator in the form of a plurality of light beam emitters 50–53.” *Id.* at 5:13–15. “Each pair of emitters 50–51, 52–53 creates a pair of angled light beams which intersect at different distances in front of diffuser body 12.” *Id.* at 5:17–19. As such, “[e]ach of the pairs of light beams allows diffuser 10 to be relocated at the same repeatable distance from a subject.” *Id.* at 5:19–21; *see id.* Fig. 4. That is, each pair of emitters indicates a different distance. *Id.* at 2:30–35; *see id.* at 5:64–6:2.

Further, either of the emitter pairs, i.e., pair 50–51 or pair 52–53, are selected using a selector switch. *Id.* at 5:38–41. By selecting a particular emitter pair, the distance measurement device indicates a particular distance measurement. *See id.*

E. Peng

Peng is a paper that relates to an “automatic 3D reconstruction method” to reconstruct a 3D scene using “complementary stereo information from four cameras.” Ex. 1009, 1. In particular, Peng’s “3D model reconstruction system us[es] images acquired from multiple stereo pairs.” *Id.* at 2. Peng explains that a “normal camera” has a “limited field-of-view.”

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Id. at 6. Accordingly, Peng describes a process to “reconstruct a large and integrated scene” by “finding more than three spatial matched points between different 3D models [and] can achieve 3D model stitching.” *Id.*; *see id.* at 2–3.

F. Claims 1–5, 9–12, 15–16, and 20–23 As Obvious over Plassmann, Treuillet, and Staller

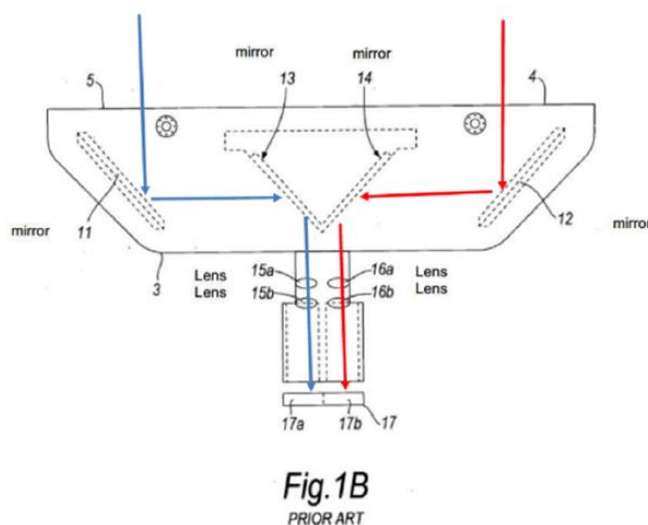
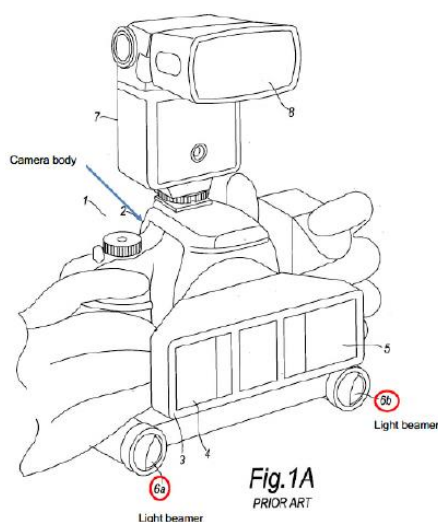
1. Claim 1

a) Claim Limitation 1.01

Claim limitation 1.01 recites

[a] device for stereophotogrammetry configured for an acquisition of two views according to two different angles, said acquisition generating a pair of images, with one image corresponding to one of the two views and the other image corresponding to the other of the two views, this pair of images being referred to as a stereo-pair.

Figures 1A and 1B of Plassmann, as annotated by Petitioner are reproduced below.



Pet. 32 (citing Ex. 1007, Figs. 1A, 1B). Plassmann identifies Figure 1A as showing a known apparatus for obtaining stereoscopic images and Figure 1B

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as showing a known adaptor used in the apparatus of Figure 1A. Ex. 1007, 12:3–6. Petitioner cites Plassmann as disclosing a device for stereophotogrammetry including adapter 3 attached to camera body 2 to capture stereo images along paths labelled in red and blue. Pet. 31. Petitioner states that Plassmann’s adaptor 3 “acquires two views of an object from two different angles via mirrors 11 and 12, to reconstruct a 3-D representation of imaged objects.” *Id.* at 32 (citing Ex. 1007, 12:25–29, stating, “[t]he first and second images are the two images needed to form a stereoimage and data from the two images may be analyzed using suitable software to produce a three-dimensional representation of the subject.”).

Patent Owner contends that Petitioner fails to establish that Plassmann’s sub-optics are configured to acquire their views according to two different angles, as claimed. PO Resp. 26–31. Citing Petitioner’s annotated versions of Plassmann, Patent Owner contends that Petitioner acknowledges Plassmann teaches views that are along parallel optical axes and not on optical axes that are at two different angles. *Id.* (citing Pet. 22–23, 31–32); *see id.* at 30 (stating “[t]he Petition does not contend that Plassmann’s optical axes or view frustums are not parallel.”). Noting Petitioner’s assertion that in Plassmann mirrors 11 and 12 acquire two different views of an object from two different angles, Patent Owner repeats its contention that the spacing of the mirrors means only that each mirror acquires a different view, not that the views are acquired at different angles, a contention that we found unpersuasive in our claim construction analysis. *Id.* at 30–31; *see* Section V herein.

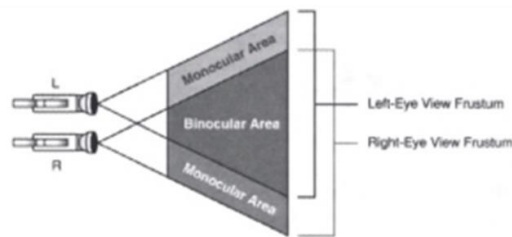
According to Patent Owner “[t]his parallelism of the optical axes means the angles of the views of the sub-optics are the same, not different.” *Id.* at 30. As we discuss extensively in Section V herein, we decline to adopt

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a claim construction of the two views that requires the optical axes of the sub-optics be at different angles, as Patent Owner advocates. Instead we construe claim 1's "two views according to two different angles" language to not require that the optical axis of each sub-optic be angled, but instead to only require that the sub-optics view the subject from different angles.

Reproduced below is Patent Owner's illustration of a conventional stereophotogrammetry device configured to acquire two views that Patent Owner characterizes as being at the same angle.



Id. at 5 (citing Ex. 2020, 90; Ex. 2018, van der Weide Decl. ¶ 67).

According to Patent Owner, the L and R camera are configured, i.e., spaced, to acquire two views, but because the "Left Eye View Frustum" and the "Right Eye View Frustum" are parallel, the two views are parallel and acquired at the same angle. *Id.* Patent Owner's acknowledgment of this arrangement as conventional is important, as the claim as construed above encompasses this arrangement.

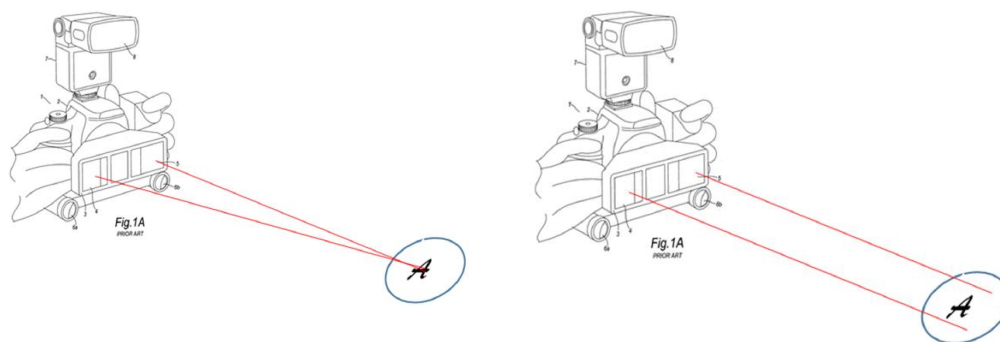
Petitioner further argues that even if we construed the "two views according to two different angles" limitation to exclude parallel sub-optics, as Patent Owner suggests, Plassmann discloses the limitation because Plassmann's example image (a stylized letter A recessed into the surface of a pot of hand cream) can appear in the same position in left and right hand images only if both sub-optics were angled inward. Reply 10–11; Ex. 1007, 12–13. Patent Owner contends we should ignore this argument because

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Petitioner manipulated the width-to-height ratio when creating the illustration discussed at page 11 of the Reply. Sur-reply 11–12. Even if the scale in Petitioner’s illustration is incorrect, the point of Petitioner’s illustration does not concern the size and height of the image, but instead, demonstrates that the image of the stylized A appears in the center of the circle representing the pot of cream (as in Plassmann, Fig. 3A) when Plassmann’s sub-optics is angled inward and appears shifted in each of the left hand and right hand images if the sub-optics is parallel. *See* Ex. 1053 Supp. Otto Decl. ¶¶ 42–48. Dr. Otto notes that Petitioner’s position is consistent with the position asserted by Dr. van der Weide, i.e., that parallel sub-optics would produce images in which the object is markedly shifted in each image. *Id.* ¶ 36 (citing Ex. 2018, van der Weide Decl. ¶ 68). Patent Owner contends that Petitioner’s argument that Plassmann’s sub-optics is angled inwards fails because Fig 3A of Plassmann illustrates the images actually are shifted. Sur-reply 12–16.

Petitioner further supports its analysis with the following annotated versions of Figure 1A of Plassmann, shown side by side.



PO Resp. 10–11. Petitioner states that its annotated figure on the left is indicative of Plassmann’s sub-optics angled inward and the annotated figure

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on the left is indicative of a parallel sub-optics. *Id.*; *see also* Ex. 2044, 4¹⁰ (showing target beams of MAVIS II merging when camera located 80 cm from target).

For purposes of claim 1, we need not determine whether Plassmann discloses inwardly angled sub-optics, as we construed “two views according to two different angles” language to not require that the optical axis of each sub-optic be angled, but instead to require only that the sub-optics view the subject from different angles. Accordingly, we find that Petitioner has demonstrated that Plassmann would have disclosed claim limitation 1.01 to a person of ordinary skill in the art.

b) Claim Limitation 1.02

Claim limitation 1.02 recites

wherein the device is further comprising a positioning system (34) configured to signal when a target subject (S) is reaching one of at least two distinct pre-defined distance positions (A3, A4) relative to the stereophotogrammetry device, the at least two distinct predefined distance positions comprising a closer distance position (A4) and a farther distance position (A3), the closer distance position (A4) corresponding to the target subject (S) being closer to the stereophotogrammetry device and the farther distance position (A3) corresponding to the target subject (S) being farther to the stereophotogrammetry device.”

Petitioner asserts that the combined teachings of Plassmann, Treuillet, and Staller disclose claim limitation 1.02. *See* Pet. 33–39. Petitioner cites Plassmann as disclosing a camera equipped with a positioning system having LEDs that produce low powered light beams 6a, 6b. *Id.* at 33. The LEDs have focusing lenses arranged to cause the light beams 6a, 6b to

¹⁰ Page number refers to page number printed at the bottom of the page of the “Good Practice Guide to the Use of Mavis 2” July 2006.

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converge at a point that is a fixed and desired distance from the apparatus, such that the distance corresponds to the distance where the camera lens is focused. *Id.* at 33–34 (citing Ex. 1007, 12:7–13; Ex. 1003, Declaration of Gerhardt Paul Otto, Ph.D. (“Otto Decl.”) ¶¶ 371–372).

Petitioner contends that a person of ordinary skill would have understood that the device described in Plassmann (i.e., the later generation MAVIS II referred to by Treuillet), like any stereophotogrammetry device, has a depth of field containing many distances at which the camera is focused. *Id.* at 34; *see also id.* at 34 n.5 (citing Ex. 1016, 755; Ex. 1003, Otto Decl. ¶ 374). Petitioner relies on Treuillet to confirm that Plassmann’s device was capable of an expanded depth of field sufficient to image a subject at multiple positions within a 30 cm range, including at least three predefined distance of 65, 80 and 95 cm. *Id.* at 34–37 (citing Ex. 1003, Otto Decl. ¶¶ 116, 377; Ex. 1016, 755). Petitioner argues that both Plassmann and Treuillet describe the use of stereophotogrammetry for wound assessment and monitoring and that Treuillet counsels positioning the device at different distances depending on a wound’s size, locations and healing progress over time. *Id.* at 35–36.

Petitioner cites Staller as disclosing a positioning system employing multiple pairs of light beams to define more than one predefined position. *Id.* at 38. According to Petitioner, a person of ordinary skill would have understood Staller’s disclosure of light beams 56, 57 converging at point 58 on the subject a distance 59, to provide further positioning for taking a picture of a face. *Id.* at 38–39 (citing Ex. 1006, 6:9–15, Fig. 4; Ex. 1003, Otto Decl. ¶ 387). Petitioner argues a person of ordinary skill “would understand Staller’s different light beam pairs, because all intersect along a

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centerline, converge at locations closer to, and farther away from, the device.” *Id.* at 39 (citing Ex. 1003, Otto Decl. ¶ 388).

Petitioner contends that a person of ordinary skill would have had reason to combine the teachings of Plassmann, Treuillet, and Staller. *See id.* at 39–42. Noting that Plassmann and Treuillet are closely related, Petitioner observes that “[t]he device Treuillet describes is identical to that depicted in Plassmann.” *Id.* at 40 n.6 (quoting Ex. 1016, 755, describing MAVIS II as “a reflex digital camera equipped with special dual lens optic for recording two images from slightly different viewpoints, generating a stereo pair” in which “two tube-shaped projectors produce beams of light which intersect in a single spot when the camera is held at the right distance (about 80 cm from the wound”). Petitioner states that, as both Treuillet and Plassmann concern two versions of the same stereophotogrammetry device, a person of ordinary skill would have been motivated to predefine two distances, one closer and one farther away, for different levels of magnification. *Id.* at 39–40. Petitioner further states that “[t]he need to reproducibly image features from these repeatable distances would have further motivated POSITA to apply the teachings of Staller, regarding use of two pairs of light beamers, with the device disclosed in Plassmann/Treuillet, to identify those positions.” *Id.* (citing Ex. 1003, Otto Decl. ¶¶ 138–143, 391).

Patent Owner characterizes Petitioner’s arguments as

modify[ing] Plassmann’s beamers that converge at a different distance than do Plassmann’s already-existing beamers, “including at predefined distances of 65 centimeters or 95 centimeters, as well as all distances in-between,” because Treuillet allegedly teaches that Plassmann has a depth of field (“DOF”) at 65–95 cm, and the prior art teaches imaging a subject at different distances using a single camera.

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PO. Resp. 32. Noting the importance of image focus to 3-D reconstruction of wounds and patient treatment, Patent Owner contends that a person of ordinary skill would not have had reason to modify Plassmann to purposely image at a distance of degraded focus and, in fact, would have been discouraged from doing so. *Id.* at 32–38.

Patent Owner asserts that a person of ordinary skill would understand that focus varies as the distance from the camera changes, including laterally, due to lens curvature and other physical properties. *Id.* at 35. As a result, the focus of a subject at the center of lens differs from the focus at a radial distance from the center, such that the image degrades as radial distance from the center increases. *Id.* Patent Owner further contends that Petitioner’s assertion there are many distances within Plassmann’s depth of field (DOF) sufficient to accurately image a subject is inconsistent with Plassmann’s because Plassmann teaches there is only one distance where the camera is focused and focus degrades at points away from that distance in any direction. *Id.* at 36 (citing Ex. 1007, 12; Ex. 2018, van der Weide Decl. ¶¶ 146–147, 151).

According to Patent Owner, all the references Petitioner cites expressly teach imaging at the optimally focused distance. *Id.* at 37–41. Patent Owner cites, for example, Treuilett’s discussion of MAVIS II as having beams of light that intersect at a single spot the “right distance” for the camera as providing optimal focus and the sharpest image. *Id.* at 37 (citing Ex. 1016, 755; Ex. 2018, van der Weide Decl. ¶ 154). According to Patent Owner “[b]y definition, all other distances are ‘the wrong distance.’” *Id.* (citing Ex. 2018, van der Weide Decl. ¶ 154).

Patent Owner argues that Petitioner’s reliance on Staller as providing a reason to modify Plassmann to place images at distances other than the

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optimum distance is improper because, unlike Staller's uncalibrated 2-D methodology, the scale of Plassmann's 3-D reconstruction is already known exactly from calibration and triangulation and the reconstructions can be viewed at any desired level of magnification. *Id.* at 40. Patent Owner contends, that as a result, there is no benefit derived by modifying Plassmann based on Staller's teachings. *Id.*

As Petitioner points out, however, Patent Owner does not deny that, to the extent that a stereophotogrammetry device is capable of taking adequate images within a depth of field sufficient to accommodate two distances, a person of ordinary skill would have found it obvious to use two pairs of intersecting beamers, such as disclosed in Staller, to denote those distances. Reply 17 (citing Ex. 1053, Supp. Otto Decl. ¶ 65; Ex. 1003, Otto Decl. ¶ 388; Ex. 1006, 5:56–6:2).

Patent Owner further contends that Petitioner's reliance on Treuilett as counseling positioning an imaging device at different distances does not apply to stereophotogrammetry devices, such as that taught by Plassmann, and results from Treuilett's particular imaging method, i.e., using only a standard handheld digital camera to obtain a single image at a time, requiring two images take at different distances at different times. *Id.* at 41 (citing Pet. 35; Ex. 2018, van der Weide Decl. ¶ 168). Patent Owner further argues that Treuilett does not vary distance based on wound size and location, but accounts for these factors by choosing the optical zoom factor of the lens to obtain the best framing. *Id.* (citing Ex. 1016, 756; Ex. 2018, van der Weide Decl. ¶¶ 167, 169).

Noting that Plassmann uses the term MAVIS (not MAVIS II), Patent Owner further contends that the record does not support a conclusion Treuilett's description of MAVIS II refers to the same device as Plassmann.

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PO Resp. 42. Petitioner notes that Plassmann's consistent use of the term MAVIS, without specifying the version of the device, and contends that a person of ordinary skill, would understand that MAVIS in Plassmann (Ex. 1007) also refers to the MAVIS II device. Reply 18–19 (citing Ex. 1054, Transcript of Deposition of Dr. Jean-Phillippe Thirion (Public Version) (“Thirion Tr.”) 87:23–25 (noting the inventor identified the device disclosed in Plassmann (Ex. 1007) as MAVIS II)).

Patent Owner further argues that Treuilett does not mention depth of field (DOF) and does not teach that MAVIS II had a DOF of ± 15 cm. Patent Owner contends that, because wounds are 3-dimensional, Treuilett's device must be able to image a volume of space around the right distance in order to accurately image, reconstruct, and measure wounds and that a person of ordinary skill would understand that imaging away from that right distance increases inaccuracy. PO Resp. 43–44 (citing Ex. 1016, 755; Ex. 2018, van der Weide Decl. ¶ 183). According to Patent Owner, even if Plassmann had a DOF of ± 15 cm, a person of ordinary skill would not modify Plassmann to add beamers at 65 and 95 cm because images at those distances would be degraded and inaccurate. *Id.* at 44 (citing Ex. 2018, van der Weide Decl. ¶¶ 185–186).

Petitioner points out that Patent Owner ignores Petitioner's arguments of distances between 80 and 120 cm. Reply 20 (citing Pet. 49–52). Petitioner further contends that Patent Owner misstates Petitioner's argument. i.e., that a person of ordinary skill would have understood the device depicted in Plassmann, like any stereophotogrammetry device, has a depth of field containing many distances at which the camera is focused and that Treuilett confirms that Plassmann's device has an extended depth of field sufficient to image a subject at multiple positions, included at

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predefined distances of 65 cm and 95 cm, as well as at distances in between.

Id. (citing Ex. 1053, Supp. Otto Decl. ¶ 74)

Patent Owner argues that Treuilett denigrates MAVIS II by calling it cumbersome and unsuitable and plainly criticizes MAVIS II for requiring prior careful calibration to take images at the right distance. *Id.* at 45.

Patent Owner states Treuilett touts that it can

take “free captured” “images at different distances” (*i.e.*, “successive camera positions” that are “unknown”) with “free-handled,” “free zooming” digital cameras, because its images are “uncalibrated,” “requiring no additional equipment or calibration.” Exs. 1016, 752, 755, 756; 2018 ¶189. MAVIS II’s “careful calibration” prevents its use for such free capture of images at different distances. Ex. 2018 ¶189.

Id. at 45–46. According to Patent Owner, “Treuillet’s criticisms are plainly directed to the “unsuitability” of MAVIS II for “taking images at different distances,” and would discourage POSITA from modifying Plassmann to do so. *Id.* at 46. Petitioner notes, however, that Plassmann-style handheld stereophotogrammetry continued to be used after Treulitt’s proposed improvement, notwithstanding the need to calibrate such devices for the nominal distances at which the subject is positioned. Reply 20–21 (citing Ex. 1016, 755; Ex. 1015 (“Hoeffelin”)¹¹; Ex. 1007).

Petitioner replies to Patent Owner’s arguments that a person of ordinary skill would not take images at distances other than the “optimal focus” distance by noting Dr. van der Weide’s acknowledgement that

¹¹ H. Hoeffelin, D. Jacquemin, V. Defaweux, and J L. Nizet, A *Methodological Evaluation of Volumetric Measurement Techniques including Three-Dimensional Imaging in Breast Surgery*, BioMed Research International Volume 2014 Hindawi Publishing Corp. (discussing testing of Patent Owner’s 3D LIfE Viz system).

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dermatologists and others employ numerous devices designed specifically to image subjects at multiple distances. Reply 14 (citing Ex. 1053, Supp. Otto Decl. ¶ 51); *see also* Ex. 2018, van der Weide Decl. ¶ 166 (acknowledging Treuilett describes a handheld camera taking two images at different distances from the subject at different times). Petitioner further points out that neither Petitioner nor its expert advocates combinations that take blurred photographs, i.e., photographs taken out of the depth of field. Reply 14 (citing Ex. 1053, Supp. Otto Decl. ¶ 62). Petitioner persuasively argues that, contrary to Dr. van Der Weide's assertions, the prior art does not teach a camera's focus must be as high as possible, but need only be located to provide images as sharp as necessary for the application to which the images are to be applied. *Id.* at 16 (citing Ex. 1053, Supp. Otto Decl. ¶ 62). Petitioner points out examples where persons of ordinary skill employ stereophotogrammetry devices to image non-optimally focused area, e.g. where if the leading edge of a face is positioned at an imaging device's focal plane much of the imaged face extends beyond that distance; similarly, when beams intersect on a subject's chest, the breast extends forward of the focal plane and the torso extends beyond it. *Id.* (citing Ex. 1053, Supp. Otto Decl. ¶¶ 61, 62; Ex. 1054, Thirion Tr. 72:4–15, 78:11–79:14).

Finally, as Petitioner notes, much of Dr. van der Weide's testimony concerning less than perfect focus emphasizes 3D reconstruction of anatomical surfaces and medical applications of stereophotogrammetry. Reply 16. The claims are not limited to such application requiring such precision. *Id.*

The preponderance of the evidence, as discussed above and as Petitioner identifies, best supports that a person having ordinary skill in the art would have found it obvious to modify Plassmann's

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stereophotogrammetry device, based on what was known in the art, to have multiple predefined positions for repeatability. Plassmann already teaches use of one pair of light beams for positioning, and a person having ordinary skill in the art would have understood that the Plassmann device could benefit from multiple pairs of light beams in the same way the Staller device benefits from multiple pairs of light beams to enable positioning at more than one repeatable distance from the camera.

Patent Owner does not offer any other substantive arguments concerning claim limitation 1.02. For the reasons discussed above, having reviewed the evidence and arguments of record, we find that Petitioner has demonstrated a person of ordinary skill would have had reason to combine the teachings of Plassmann, Treuilett, and Staller and that their combined teachings would have disclosed or suggested claim limitation 1.02 to such an ordinarily skilled artisan.

c) Objective Indicia

(1) Introduction

Objective indicia of nonobviousness may include long-felt but unsolved need, failure of others, unexpected results, commercial success, copying, licensing, industry praise, and expert skepticism. *Mintz v. Dietz & Watson, Inc.*, 679 F.3d 1372, 1379 (Fed. Cir. 2012). Objective indicia are only relevant to the obviousness inquiry if there is a nexus between the claimed invention and the objective indicia of nonobviousness. *In re Affinity Labs of Tex., LLC*, 856 F.3d 883, 901 (Fed. Cir. 2017). A rebuttable presumption of nexus applies only “when [a patent owner] shows that the asserted objective evidence is tied to a specific product and that product ‘embodies the claimed features, and is coextensive with [the claims].’” *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (quoting

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Polaris Indus. v. Arctic Cat, Inc., 882 F.3d 1056, 1072 (Fed. Cir. 2018)). On the other hand, a patent owner is not entitled to a presumption of nexus if the patented invention is only a component of a commercially successful machine or process. *Id.* (reaffirming the importance of the “coextensiveness” requirement).

Applying *Fox Factory*, the Board uses a two-step analysis in evaluating nexus between the claimed invention and objective evidence of nonobviousness, also referred to as secondary considerations. *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 33 at 33 (PTAB Jan. 24, 2020) (precedential). We consider whether Patent Owner has demonstrated “that its products are coextensive (or nearly coextensive) with the challenged claims,” resulting in a rebuttable presumption of nexus. *Id.* If not, that “does not end the inquiry into secondary considerations”; “the patent owner is still afforded an opportunity to prove nexus by showing that the evidence of secondary considerations is the ‘direct result of the unique characteristics of the claimed invention.’” *Id.* (quoting *Fox Factory*, 944 F.3d at 1373–75). For the reasons discussed below, we find that Patent Owner has not demonstrated that its products are coextensive with the challenged claims and has not demonstrated the requisite nexus with evidence that the secondary considerations are the direct result of the unique characteristics of the claimed invention.

(2) Coextensiveness

Patent Owner asserts that its LifeViz Infinity product “is disclosed and claimed in the [’]334 patent,” and that Petitioner does not dispute this assertion. PO Resp. 57 (citing Pet. 75–76). Accordingly, Patent Owner asserts it is entitled to a presumption of nexus of secondary considerations. *Id.* (citing *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1330 (Fed. Cir. 2016)).

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Patent Owner's mere allegation that its LifeViz Infinity product is covered by the claims of the patent is insufficient to establish the claims of the '334 patent and LifeViz Infinity are coextensive. Patent Owner cites the testimony of Dr. van der Weide that: "I have reviewed the LifeViz Infinity device and conclude that it embodies the invention of the ['']334 Patent. More specifically, the Infinity possesses all the features listed in claim 1 of the patent." *Id.* (citing Ex. 2018, van der Weide Decl. ¶ 213). Neither Patent Owner nor Dr. van der Weide offer any analysis that demonstrates the LifeViz Infinity product is coextensive (or nearly coextensive) with the challenged claims. *Id.*; *see also* 37 C.F.R. § 42.65(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.").

Moreover, Patent Owner's reliance on *WBIP* is misplaced. In that case, "WBIP presented evidence that specific products . . . [we]re embodiments of the invention as claimed in the asserted claims," and that provided a basis for finding a presumption of nexus. *WBIP*, 829 F.3d at 1329–31. Such is not the case here.

Patent Owner does not provide the analysis required to demonstrate that Infinity is coextensive (or nearly coextensive) with the challenged claims. PO Resp. 55; *Lectrosonics*, Paper 33 at 33. We, therefore, find that a presumption of nexus is inappropriate.

(3) *Direct result of unique characteristics of the claims*

In the second step of our analysis, we look to whether Patent Owner demonstrates the requisite nexus with evidence that any secondary considerations are the direct result of the unique characteristics of the claimed invention. We address below Patent Owner's arguments directed to

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the secondary considerations of (i) commercial success, (ii) copying, (iii) long-felt need, and (iv) praise for the invention. PO Resp. 57–68.

As an initial matter, we note that throughout its secondary indicia arguments, Patent Owner distinguishes between non-portable devices that can be used for imaging both facial and torso features, e.g. Patent Owner’s LifeViz products and Petitioner’s Vectra H1 products, and portable devices having such dual measurement capability, e.g. Patent Owner’s Infinity product and Petitioner’s Vectra H2 product. *See generally id.* Patent Owner’s emphasis of a long-felt need for a dual-measurement capability portable device and its creation of a new market for such a device, is not commensurate with the language of all the challenged claims of the ’334 patent. Although the Specification states that it discloses a “portable stereophotogrammetry device,” (e.g., Ex. 1022, 3:46), and a device and method “specifically intended to acquire with a single portable stereophotogrammetry camera views of subject at two distances” (*id.* at 11:43–46), the claims recite only a “[d]evice for stereophotogrammetry configured for an acquisition of two views according to two different angles” (*id.* at 11:54–55). Only claim 3 recites that the device is a portable system. Ex. 1022, 12:10–11. Neither party has proposed a construction that limits the remaining claims to a portable device or a device with a single camera.

Petitioner notes that Patent Owner’s long-felt need and commercial success arguments concern imaging both the face and body or fields of view that correspond to those surface areas. Reply 26. Accordingly, Petitioner points out that, because only claims 3, 4, and 11 recite imaging both the face and body, Patent Owner’s long felt need arguments are relevant to the subject matter of claims 3, 4, and 11 of the ’334 patent, at most. *Id.* Patent

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Owner does not address claims 3, 4, and 11 specifically. Petitioner further points out that Patent Owner's evidence and arguments do not demonstrate the existence of a long-felt need addressed by the any of subject matter recited in the challenged claims prior to Patent Owner's introduction of its commercial product. *Id.* at 26–27. The Petition does not discuss LifeViz Infinity, except to point out that Petitioner's expert witness, Dr. Otto, is active in the relevant market and has not seen widespread commercial success, consumer acclaim, or industry praise of LifeViz. Pet. 75–76 (citing Ex. 1003, Otto Decl. ¶¶ 437–439 (noting that Patent Owner alleges LifeViz Infinity is covered by the claims of the U.S. Patent No. 10,070,119 B2 (“the ’119 patent”)¹², U.S. Patent No. 10,163,253 B2 (“the ’253 patent”)¹³, and the ’334 patent that this is the subject of this proceeding)).

As discussed further below, even in the context of claims drawn to a portable, dual distance imaging stereophotogrammetry device, Patent Owner has not provided sufficient evidence that secondary considerations are the direct result of the unique characteristics of the claimed invention

(a) Long-Felt Need

Patent Owner argues that the invention claimed in the ’334 patent addresses a long-felt need. PO Resp. 57–61; Sur-reply 26. Patent Owner acknowledges that in the mid-2000s Dr. Plassmann developed MAVIS II, a system with a pair of light beamers that converge at a distance coinciding with the focal plane of the device at which the image is to be take. PO Resp.

¹² See *Canfield Scientific, Inc. v. QuantifiCare S.A.*, IPR2021-01511, Paper 61 (PTAB March 9, 2023) (Final Written Decision, finding all challenged claims (claims 1–4 and 8–11) unpatentable).

¹³ See *Canfield Scientific, Inc. v. QuantifiCare S.A.*, IPR2021-01518, Paper 61 (PTAB March 9, 2023) (Final Written Decision, finding all challenged claims (claims 1–4, 8–12, 15, 16 and 20–23) unpatentable).

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59. Patent Owner also states that in 2007, it “developed and launched the LifeViz stereophotogrammetry camera,” a device that was “[s]imilar to MAVIS II” and “was a portable, handheld, single camera device with one pair of beamers converging at the focus distance of the camera, and subjects were imaged at that distance.” *Id.* (citing Ex. 2024, Declaration of Dr. Jean-Phillipe Thirion (“Thirion Decl.”) ¶¶ 9–12). Patent Owner states that “LifeViz was configured and marketed for imaging faces” and its experimental use of LifeViz for imaging at distances of 100 cm or more did not provide sufficient resolution for aesthetic and cosmetic purposes. *Id.* (citing Ex. 2024, Thirion Decl. ¶¶ 20–21).

According to Patent Owner “[a]t the time of invention [of the ’334 patent], there were no portable, ‘all-in-one’ handheld stereophotogrammetry devices for imaging both face and breast/torso.” *Id.* at 60 (citing Ex. 2024, Thirion Decl. ¶¶ 25–26, 29). “To image both, practitioners had to purchase one device for face and one for breast/torso, or purchase the large, costly multi-head Canfield XT,” which Patent Owner contends had disadvantages. *Id.* (citing Ex. 2024, Thirion Decl. ¶¶ 25–26, 29; Ex. 1001, 1:49–52).

Patent Owner argues that “[a]ccordingly, since at least the 2007 introduction of LifeViz, there was a long-felt need for a portable single-camera stereophotogrammetry device that avoided the disadvantages of purchasing multiple devices or a multi-head device like the Canfield XT.” *Id.* (footnote omitted) (citing Ex. 2018, van der Weide Decl. ¶ 212; Ex. 2024, Thirion Decl. ¶ 30; Ex. 2025, 4). According to Patent Owner, “[t]o address that deficiency, [Patent Owner] developed Infinity in 2015, filed for a patent thereon on October 14, 2015, and began commercial sales one year later.” *Id.* at 60–61 (citing Ex. 2024, Thirion Decl. ¶¶ 28–29).

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Patent Owner contends that its Infinity product satisfied a long-felt need, as demonstrated by industry praise and commercial success. *Id.* at 61 (citing Ex. 2024, Thirion Decl ¶ 30; Ex. 2025, 4). Patent Owner cites the deposition testimony of Petitioner’s chief technology officer, Dr. Otto, that “it ‘was desired to do breast imaging,’ there was ‘a big demand’ to image ‘both areas,’ and [Petitioner] ‘didn’t want to have a separate product to do breast imaging.’” Sur-reply 26 (citing Ex. 2042, Transcript of October 21, 2022 Deposition of Dr. Paul Otto (“Otto Tr.”) 17:22–18:17). In contrast to demonstrating a long-felt need, however, when taken in context, Dr. Otto’s testimony merely suggests the logical development of a market niche. *See* Ex. 2042, Otto Tr. 18:4–17 (testifying that Petitioner “had for years been making products - - non-portable products which did both face and breast imaging,” that Petitioner “had already developed the H1 portable device which did face imaging, and that was very successful, so there came a question of what next,” and “we didn’t want to have a separate product to do breast imaging, so we thought, okay, how do we do face and breast?”).

“[L]ong-felt need is analyzed as of the date of an articulated identified problem and evidence of efforts to solve that problem.” *Texas Instruments Inc. v. U.S. Int’l Trade Comm’n*, 988 F.2d 1165, 1178 (Fed. Cir. 1993).

Although Dr. Thirion testifies to the capabilities of the 2007 LifeViz product, Patent Owner does not provide evidence showing that the LifeViz product’s single pair of beamers converging at one distance was considered a problem needing solution in 2007. *See* Ex. 2024, Thirion Decl. ¶¶ 9–12. Instead, Patent Owner’s evidence demonstrates that separate commercial products were available to image facial features and breast features. *Id.* ¶¶ 21, 25–26. Patent Owner’s unsuccessful experimentation with certain non-commercial products, does not, by itself, demonstrate the industry

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perceived a long felt need for a product, such as Infinity. PO Resp. 59–60 (citing Ex. 2024 ¶ 20). The incorporation of additional dual distance measurement capabilities into the later generation Infinity product does not evidence the industry perceived a long-felt need that Infinity met. Patent Owner does not provide evidence showing an articulated, identified problem and efforts to solve that problem. Nor does Patent Owner provide evidence that Infinity was met with skepticism or that persons of ordinary skill in the art tried and failed to achieve the claimed invention.

In addition, we are not persuaded by Patent Owner’s attempt to bootstrap its alleged industry praise and commercial success arguments into a demonstration of a long-felt need for the claimed invention. Both commercial success and industry praise can result from exploiting a newly created market niche without the existence of a long-felt need for the claimed subject matter. *See* Ex. 2024, Thirion Decl ¶ 30 (testifying that Infinity created a new market for sales, but not providing direct evidence that a long-felt need had existed in the industry); Ex. 2025, 4 (stating that Infinity “is the first portable 3D imaging system capable of capturing face, body, and breast areas thanks to two sets of dual beamer pointers which allow for two distance settings,” but without stating it met a long-felt need). As discussed above, contrary to Patent Owner’s assertions, Dr. Otto’s deposition testimony is evidence of a logical market development for products with progressively improving capabilities, rather than evidence of an unsolved long-felt need solved by the claimed subject matter. Ex. 2042, Otto Tr. 17:22–18:17.

Patent Owner’s long-felt need based on commercial success arguments are also unavailing. That sales of Patent Owner’s traditional line of products have not been reduced by its introduction of its Infinity dual

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distance product suggests the absence of a long-felt need because its existing products are adequate to meet the needs of the current market, i.e., (i) there has not been a rush to substitute Infinity for the base of installed products and (ii) Infinity sales did not “eat into” current Life Viz Mini or Body sales. *See* PO Resp. 64 (citing Ex. 2025, 4; Ex. 2024 ¶ 36 (“sales of LifeViz Infinity have not significantly impacted sales of its single-distance devices. Rather sales of these devices regularly increased, year by year.”)).

In sum, Patent Owner does not offer sufficient evidence to show a long-felt need solved by the claimed subject matter. Thus, we find that Patent Owner has not shown the requisite nexus between the purported long-felt need and the unique characteristics of the claimed invention.

(b) Praise

Patent Owner begins its industry praise argument by reiterating its assertion that Infinity embodies the invention disclosed and claimed in the ’334 patent and therefore a nexus is presumed. PO Resp. 61 (citing *WBIP*, 829 F.3d at 1330). We find this argument unavailing for the same reasons as those discussed above, i.e., Patent Owner does not demonstrate that a presumption should attach because Patent Owner does not show coextensiveness. *See supra* Section VI.F.1.c.3.a.

Patent Owner also argues Infinity’s receipt of a prestigious award, the 2018 EuroMediCom Best Aesthetic Device Award, establishes nexus based on industry praise. PO Resp. 61 (citing Ex. 2024, Thirion Decl. ¶ 33); Ex. 2025, 1, 4 (announcing LifeViz Infinity as a 2018-2019 Industry Winner for Best Aesthetic Device). Petitioner contends that persons of ordinary skill would know that the subject award may not be an unbiased demonstration of industry praise, as only that subset of industry participants who make a

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payment to EuroMediCom are eligible to be considered for such awards.

Ex. 1053, Supp. Otto Decl. ¶¶ 76–78.

Patent Owner quotes three portions of the EuroMediCom announcement, and argues that “[t]his praise is squarely directed to the claimed invention.” PO Resp. 61–62 (citing Ex. 2025, 4; Ex. 2018, van der Weide Decl. ¶ 214).

Below we reproduce the entirety of the announcement, italicizing the portions Patent Owner quotes in its Response.

The LifeViz® Infinity is the first portable 3D imaging system capable of capturing face, body, and breast areas thanks to two sets of dual beamer pointers which allow for two distance settings. This unique system has two acquisition modes. A tripod mounted camera and turntable quickly capture a 360° 3D body image. Eight images are automatically taken and seamlessly stitched to produce a “life-like[”] 3D image of the body for visualization by the physician and patient. In hand-held mode, the camera is capable of generating 3D images of face and breast to simulate procedures and photo-document before/after interventions, without blocking an entire exam room with cumbersome equipment.

With a simple flip of a switch, dual beam pointers adjust to the distance ideal for face or body applications without the need for cumbersome repositioning and/or multi-headed systems. Superior image quality has been achieved by improving the optic performance. The LifeViz® Infinity produces excellent pictures from both near and far thanks to an increased deep field of view. Finally, a powerful external flash removes the need for specific lighting conditions and additional equipment ensuring reproducible images from one session to the next. The LifeViz® Infinity is comprised of a portable stereovision camera, a software suite including an image database, 3D viewer tool, 3D skin analysis, face, breast, and body measurements and simulation modules. All aspects of 3D documentation, comparison, simulation, and measurement ranging from medical to cosmetic applications are possible with this single unique device.

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Ex. 2025, 4 (*italics* emphases added). The announcement broadly describes the Infinity product, including many additional features that the Patent Owner Response does not discuss, including “a tripod mounted camera and turntable”; “[e]ight images are automatically taken and seamlessly stitched to produce a ‘life-like’ 3D image of the body for visualization”; “a powerful external flash”; and “a software suite including an image database, 3D viewer tool, 3D skin analysis, face, breast, and body measurements and simulation modules.” *Id.*

As the announcement touts many features of Patent Owner’s Infinity product, we cannot assess whether praise for Patent Owner’s product is grounded in a claimed feature, or other features, or a combination thereof. Patent Owner does not directly compare the announcement with the challenged claims, and does not clearly identify what Patent Owner contends are the unique characteristics of the claimed invention being praised. Moreover, the challenged claims are of varying scope, and Patent Owner does not address those differences. Accordingly, Patent Owner does not show that the purported praise in the form of the Euro Medi Comm recognition is a direct result of the unique characteristics of the claimed invention.

The Patent Owner Response also cites the comments of three medical professionals’ as evidence of “praise [is] directed to the claimed invention.” PO Resp. 62 (citing Ex. 2026,¹⁴ 11, 19–20). In particular, Patent Owner quotes from Dr. Baie-Bong Lee’s testimonial that “[a]lthough regular 2D pictures are inconvenient, capturing a face or body in 3D with the 3D

¹⁴ *Testimonials: What our customers say*, QuantifiCare, available at <https://www.quantificare.com/learn/testimonials/>; see also *id.* at 2, 8, 10, 17 for addition citations by Patent Owner.

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LifeViz® Infinity is easier. First of all, you have a unique device for standardized photography with a switch that adjusts the ideal distance for face and body.” *Id.* (citing Ex. 2026, 19). Patent Owner does not relate this portion of Dr. Lee’s testimonial to the ’334 patent claims, and fails to show that the purported praise is a direct result of the unique characteristics of the claimed invention.

Patent Owner also quotes the testimonial of Dr. Kian Karimi who describes Infinity as “a state of the art, easy to use photographic system that has become an essential part of our consultation for face and body procedures.” *Id.* (citing Ex. 2026, 20). Describing Dr. Myriam Fopp as one who “uses LV Infinity for face (‘Wrinkles, Pores’) and body,” Patent Owner quotes Dr. Fopp as stating that “[w]e also use our LifeViz® Infinity technology for body treatments.” *Id.* (citing Ex. 2026, 11). None of the subject matter Patent Owner quotes from Dr. Karimi and Dr. Fopp concerns the limitations of the ’334 patent claims.

Patent Owner’s reference to the testimonials of Drs. Lee, Karimi and Fopp is unavailing because Patent fails to show that the purported praise is a direct result of the unique characteristics of the invention claimed in the ’334 patent claims. Based on record as a whole, the evidence of industry praise, is insufficient to support non-obviousness.

(c) *Commercial Success*

Patent Owner begins its commercial success argument by reiterating its assertion that Infinity embodies the invention disclosed and claimed in the ’334 patent and therefore a nexus is presumed. POResp. 63 (citing *WBIP*, 829 F.3d at 1330). We find this argument unavailing for the same reasons as those discussed above, i.e., Patent Owner does not demonstrate that a presumption should attach because Patent Owner does not show

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coextensiveness. *See supra* Section VI.F.1.c.3.a. Therefore, we consider whether Patent Owner demonstrates the requisite nexus with evidence that commercial success is the direct result of the unique characteristics of the claimed invention

For commercial success indicia to support nonobviousness, Patent Owner must “show both commercial success and that a nexus exists between that success and the merits of the claimed invention.” *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1350 (Fed. Cir. 2012). In contrast to its long-felt need arguments, Patent Owner argues commercial success demonstrates “Infinity created a new market in the industry – portable stereophotogrammetry systems for aesthetic and cosmetic fields that could adequately image at more than one distance, *e.g.*, the face and body for medical procedures.” PO Resp. 63–64 (citing Ex. 2024, Thirion Decl. ¶¶ 35–36). As we addressed in our discussion of long-felt need, a market for stereophotogrammetry systems that image at two distances and for portable stereophotogrammetry already existed. *See* Section VI.F.1.c.3.a herein. In its commercial success arguments, Patent Owner limits the market to portable systems that image at two distances and argues the following evidence of commercial success demonstrates the invention accounts for 100% of the sales in that new market: (1) Infinity sales did not reduce sales of Patent Owner’s other products (LifeViz Mini or Body), and (2) Patent Owner controlled 100% of the market prior to Petitioner’s introduction of its H2 product, *i.e.* the only other product in that market. *Id.* at 64–65.

Patent Owner’s commercial success arguments fall short for at least two reasons. First, Patent Owner’s attempt to define a new market (or at least a new sub-market or market segment) limited to portable

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stereophotogrammetry devices that image at two distances does not sufficiently tie the sales of its Infinity product to the claims of the '334 patent to that market. Aside from general allegations that Patent Owner and Petitioner are the only two entities marketing portable systems that image at two distances, Patent Owner's commercial success arguments do not tie its sales of Infinity LifeViz to the claims of the '334 patent.

Second, Patent Owner presents no evidence concerning the market itself. Patent Owner's contention that it initially controlled 100% of the market does not reflect success, but is the natural result of Patent Owner being the first entrant in the market it defines. As Patent Owner presents no arguments concerning the size of the market, e.g., the number of unit sales or the dollar amounts of such sales, there is no evidence as to the scope of the alleged commercial success. Although Patent Owner states that its sales of LifeViz Infinity increased substantially from 0% to 44% of its total sales revenue and is substantially less expensive than Vectra products, Patent Owner does not disclose its total sales, its unit sales, or other information concerning the size of the market. *Id.* at 63 (citing Ex. 2024, Thirion Decl. ¶¶ 30, 35). For example, because Patent Owner provides no evidence concerning the size of the market, we cannot assess whether Patent Owner's alleged success or dominance stems from the market being too small to accommodate additional entrants. Patent Owner also does not address whether other forces, such as up-front investment cost to enter the market segment Patent Owner defines, is a prohibitive barrier, thereby shutting out additional competitors and leaving a larger market share to Patent Owner.

We are also not persuaded by Patent Owner's attempt to bootstrap its alleged industry praise argument into its commercial success argument, by asserting that "customers have identified claimed features as important to

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their use of the invention.” *Id.* (citing *id.* at 61–62 (arguing that the claimed invention has received praise)). These arguments do not address whether any sales, for example, of the Infinity product, resulted from the merits of the claimed invention, or that such purported praise led to actual demand.

We also find unavailing Patent Owner’s argument that “Infinity sales were due to claimed features of the invention, *e.g.*, its ‘dual-distance’ functionality, which permitted customers to avoid buying multiple products or a non-portable multi-head system to accomplish the same tasks – as was noted by the Euro Medi Comm press release.” *Id.* at 64 (citing Ex. 2025,¹⁵ 4). The Euro Medi Comm announcement discussed above identifies the Infinity product as “BEST AESTHETIC DEVICE,” and describes the product, but does not evidence any specific demand for, or sales of, the Infinity product due to any features of the challenged claims. *See* Ex. 2025, 4. Patent Owner also does not sufficiently address whether dual-distance functionality comprises the unique characteristics of the claimed invention.

We also find unavailing Patent Owner’s arguments that Petitioner’s sales of its H2 products relative to its H1 products demonstrates commercial success relative to the claims of the ’334 patent. PO Resp. 65. Patent Owner contends that “[t]he primary functional difference between [Petitioner’s] H2 and H1 [products] is that H2 can image the body (at a different distance) in addition to the face,” and that “[i]t follows that the large differential in production of the H2 as compared to H1 is due to that additional functionality.” *Id.* (citing Ex. 2039¹⁶ (arguing that Vectra H1

¹⁵ *Winners 2018-2019*, EuroMediCom (Jan. 29, 2021) <https://www.euromedicom.com/mca-2018/en/trophy/Winners-2018-2019.html>.

¹⁶ *Vectra H1 Quick Reference Guide*, Canfield (2014).

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images face only); Ex. 2035¹⁷ (arguing that Vectra H2 captures a face or body image). Patent Owner's assertion is mere speculation unsupported by evidence. Patent Owner's analysis fails to consider other possible factors. For example, Petitioner argues that its H2 product has different technical features, such as the ability to refocus at different distances in a manner similar to multiple head prior art devices like the Polaroid MACRO. Reply 19 (citing Ex. 1053, Supp. Otto Decl. ¶¶ 79–81); *see also* Ex. 2041 (2018 H2 Vectra Guide discussing focusing for face, breast, and body imaging); Pet. 36–37; PO Resp. 38.

We also find unavailing Patent Owner's argument that Petitioner "does not contest that its H2 infringes, and thus its sales are relevant to the invention's commercial success." Sur-reply 25 (citing *Truswal Sys. Corp. v. Hydro-Air Eng'g, Inc.*, 813 F.2d 1207, 1215 (Fed. Cir. 1987)) & n. 12 (citing Ex. 2018, van der Weide Decl. ¶¶ 215–219). Patent Owner's reliance on *Truswal* misplaced. First, we note that Patent Owner cites to Judge Rich's dissent in *Truswal*. Second, Judge Rich stated the "once an infringer is sued *and proved to be an infringer*, its sales are appropriately proved and added to the others," and that "[i]t is necessary to establish that the alleged copies are actual infringements of the patent in suit before they can possibly be relevant and counted as successes *of the patented invention*." *Truswal*, 813 F.2d at 1215 (Rich, J., dissenting). Although Patent Owner alleges that H2 infringes, Petitioner has not been adjudged to infringe. We do not decide infringement in this forum and we find insufficient support for Patent Owner's assertion that Petitioner does not contest infringement.

¹⁷ *Vectra H2: Capturing a FACE or BODY image*, Canfield.

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In sum, we find that Patent Owner does not show sufficient nexus between the purported commercial success and the claimed invention, and fails to show commercial success.

(d) *Copying*

Patent Owner argues that Petitioner’s Vectra H2 “is a copy of *the invention*, in structure, function, operation, and use.” PO Resp. 66–68 (emphasis added). According to Patent Owner, Petitioner’s Vectra H2 mimics patented features of Infinity and unpatented color coding features, i.e., the use of red light beamers for closer imaging of the face and green light beamers for farther imaging of the torso. *Id.* at 66. Patent Owner also notes that Petitioner launched its H2 device “[e]ighteen months after [Patent Owner] launched its Infinity.” *Id.*

Petitioner replies that it did not copy Patent Owner’s invention and states that technical distinctions exist between Patent Owner’s purported invention and Petitioner’s Vectra H2 product. Reply 29 (citing Ex. 1053, Supp. Otto Decl. ¶¶ 79–81). Petitioner also states that its Vectra H2 can refocus at different distances, a design feature in prior art systems, e.g. Polaroid’s MACRO devices, that Patent Owner acknowledges is distinct from its invention. *Id.* at 29–30 (citing Ex. 1054, Thirion Tr. 127:6–128:17). As to the unpatented beamer colors, Petitioner’s expert, Dr. Otto, credibly testifies that Petitioner’s choice of red and green light beamers was made for functional reasons (it is easier to get bright LEDs in red and green than in other colors). *Id.* (citing Ex. 1053, Supp. Otto Decl. ¶¶ 80–81).

Notwithstanding similarities between the Patent Owner’s and Petitioner’s products, Patent Owner lacks sufficient evidence that Petitioner copied the ’334 patent or any claim of the ’334 patent. Patent Owner cites no evidence, for example, that Petitioner was aware of the ’334 patent

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during development of the H2 device. *See* Ex. 2042, Otto Tr. 19:5–16, 157:7–16 (Dr. Otto testifying that he was unaware of Patent Owner’s Infinity product at the time he worked on Petitioner’s H2 product). Patent Owner further lacks evidence that any particular aspect of the ’334 patent was copied. *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995) (“[M]ore than the mere fact of copying by an accused infringer is needed to make that action significant to a determination of the obviousness issue.”) (citation omitted).

Patent Owner also lacks evidence that Petitioner copied any patented product. As we explain above, Patent Owner lacks evidence that the Infinity product is coextensive or nearly coextensive with any challenged claim; the record, thus, does not establish that Infinity is a “patented product” in a relevant sense.

“Copying requires evidence of efforts to replicate a specific product, which may be demonstrated through internal company documents, direct evidence such as disassembling a patented prototype, photographing its features, and using the photograph as a blueprint to build a replica, or access to the patented product combined with substantial similarity to the patented product.” *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010). Patent Owner lacks evidence that Petitioner studied any Patent Owner product or documents when developing the H2 device. To the contrary, the preponderance of the evidence supports that Petitioner’s H2 product differs from Patent Owner’s product, including because it refocuses at different distances (a design present in prior art systems). Ex. 1053, Supp. Otto Decl. ¶¶ 79–81; *see also* Reply 29.

Thus, based on the record as a whole, Patent Owner’s allegation of copying is unpersuasive and does not support non-obviousness.

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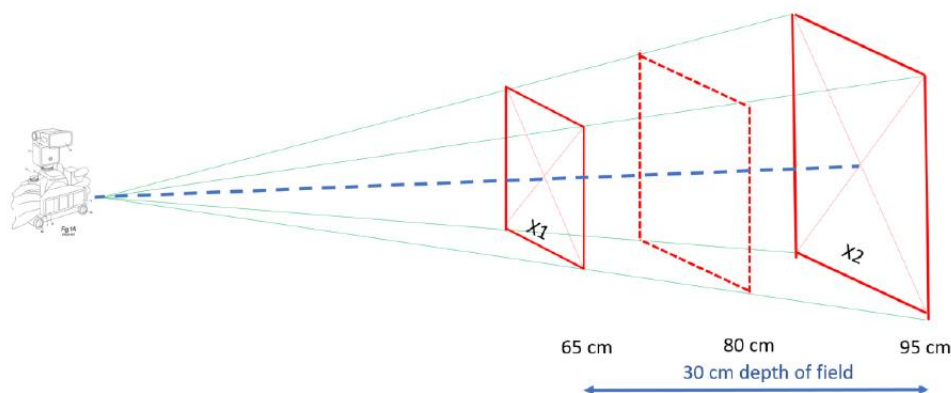
(4) Conclusion

Having considered the arguments and evidence of record we find that Patent Owner has not demonstrated that the claims are coextensive with any of its products and that Patent Owner has not demonstrated that the secondary considerations are the direct result of the unique characteristics of the claimed invention.

2. Claims 11 and 12

Claim 11 depends from claim 1 and recites that the closer distance position (A4) and the farther distance position (A3) are such that the surface of the field of view corresponding to the farther distance position (A3) is at least 25% larger than a surface of a field of the view corresponding to the closer distance position (A4). Accordingly, Petitioner notes that claim 11 recites two predefined distances where the surface of a field of view differs in the area by at least 25%. Pet. 47.

The Petition includes the illustrative figure shown below.



Id. at 48 (citing Ex. 1003, Otto Decl. ¶ 285). Petitioner states that the figure illustrates rectangular areas X1, X2 for the MAVIS device disclosed in Plassmann and Treuilett, with the closest and farthest distance is falling within its 30 cm depth of field. *Id.* Petitioner notes that as one moves further from the device shown on the left, the imaged area gets larger, such

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that X2 is always larger than X1 and contends that a farther position imaging at least 25% more than a closer position would have been obvious. *Id.* (citing Ex. 1003, Otto Decl. ¶ 285).

Petitioner notes that Plassmann and Treuilett both disclose using the Plassmann device to monitor wounds and that a person of ordinary skill would have been familiar with the principle that photographic devices used for that purpose employ multiple, predefined distances closer in position that differ in magnification from its farthest position by more than 25%. *Id.* at 48–49 (citing Ex. 1017; Ex. 1003, Otto Decl. ¶ 286). Although neither Plassmann nor Treuilett discloses the actual focal length of their lenses, Dr. Otto states that a person of ordinary skill would understand such devices may be used with any lens suitable to the subject. *Id.* at 50 (citing Ex. 1003, Otto Decl. ¶ 290). Dr. Otto confirms that devices of Plassmann’s design employing 34 mm focal length lenses could provide a 30 cm depth of field centered at 80 cm distance sufficient to encompass a field of view roughly equivalent to the A4 format and one equivalent to the A3 format (i.e., differing by more than 25%). *Id.* at 49–50 (citing Ex. 1003, Otto Decl. ¶¶ 288–292). Dr. Otto further testifies that a person of ordinary skill would know that employing dual 34 mm lenses allows configuration of the device to encompass a field of view a fraction larger than A4 at 65 cm from the device and in the field of view of A3 at 93.9 cm, both within the depth of field reported in Treuilett, whose fields of view differ in size by more than 25%. *Id.* at 50 (citing Ex. 1003, Otto Decl. ¶¶ 160–172, 292).

Petitioner further contends that a person of ordinary skill would have known of prior art publications describing the use of hand-held devices with similar dual-optic designs suitable for imaging the face and body, e.g., the LifeViz II device that can have a depth of field extending 80–120 cm. *Id.* at

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51 (citing Ex. 1015, noting LifeViz II permitted distortion free consistent imaging within a 40 cm range). Patent Owner contends that Petitioner's reference to LifeViz II (and Hoefflin) as a single device that could image face and torso is incorrect. PO Resp. 51–54. Even if Patent Owner is correct that Petitioner mis-identified LifeViz II and Hoefflin as a dual-optic design, Petitioner argues that a person of ordinary skill would have known that the device described in Plassmann and Treulitt could be configured with various lenses and different focal lengths and depths of field (e.g., by adjusting the aperture setting of the lens) at various distances as needed to image particular subjects and to configure such devices to define closer and farther imaging positions, where the area of the subject recorded at the farther position is at least 25% larger than at the closer position, as claimed. Pet. 52 (citing Ex. 1003, Otto Decl. ¶ 172).

Patent Owner argues that neither Plassmann nor Treulett identifies or discusses field of view and that Dr. Otto's model is incorrect. PO Resp. 47–49 (citing Ex. 2018, van der Weide Decl. ¶¶ 195, 203). According to Patent Owner, Dr. Otto's model is based on a single pyramidal view frustum extending from the centerline of the camera and within that frustum Petitioner depicts the supposed field of view at a distance from the camera as a rectangular area perpendicular to the centerline. *Id.* (citing Ex. 2018, van der Weide Decl. ¶ 106). Patent Owner contends that Dr. Otto's model is flawed because a stereophotogrammetry camera is not a singular frustum, as discussed by Dr. Otto, but the intersection of two separate view frustums of the sub-optics, and the field of view at a particular distance from the camera is defined by the intersection of those two frustums at that distance. *Id.* (citing Ex. 2018, van der Weide Decl. ¶ 197). According to Patent Owner,

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Dr. Otto's model results in locations where the subject is not imaged at all. *Id.* at 50; Ex. 2018, van der Weide Decl. ¶ 198.

Petitioner characterizes Patent Owner's argument as "assert[ing] that the calculations fail to account for monocular areas where the fields of view of the two suboptics do not overlap." Ex. 1053, Supp. Otto Decl. ¶ 67 (citing Ex. 2018, van der Weide Decl. ¶¶ 196–198) and that these monocular areas are insignificant. Patent Owner denies that Dr. van der Weide discussed monocular areas, but argued "rather that a stereophotogrammetry device's field-of-view is more limited than a single-view system," particularly in non-parallel systems, like those of the invention, where the crisscrossing pyramidal views first coverage/overlap and then diverge and cease to overlap at certain distances from the camera, after which there is no stereo field of view at all. Sur-reply 22–23 (citing Ex. 2018, van der Weide Decl. ¶¶ 197–198, 104, referencing Patent Owner's annotated Figure 2 of the '334 patent). We note, however, that Patent Owner extensively discusses parallel configuration with a monocular area to the left and right of the stereoscopic binocular area in the center. *See* PO Resp. 5–6 (including a similar figure as that shown on page 50 of the Response); Ex. 2018, van der Weide Decl. ¶ 68. Petitioner emphasizes that for angled sub-optics, such as those in Plassmann, the dimensions of this monocular area would be insignificant and did not need to be addressed in Dr. Otto's illustrative calculations and that Dr. van der Weide does not assert that configuration as described by Otto (or others a person of ordinary skill would have routinely configured) would not have been capable of meeting the requirements of claim 11. Reply 22 (citing Ex. 1053, Supp. Otto Decl. ¶ 68).

For purposes of assessing the recitation in claim 11 that the surface of a field of view at farther distance A3 is 25% larger than at closer distance

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A4, we need not decide the merits of the parties competing contentions concerning single or intersecting pyramidal frustums. We understand Dr. Otto's discussion merely to be illustrative of the principle that as one moves farther from the device, the imaged area is larger. Pet. 47–48. As neither party disputes this principle, we turn our attention to their remaining arguments concerning claim 11.

Patent Owner contends that Petitioner fails to consider the degradation in sharpness laterally from the optical axis. PO Resp. 50. Petitioner contends this effect is negligible. Reply 22. Neither party provides a detailed analysis of this effect. In any case, the degree of sharpness is not a limitation recited in claim 11; we direct our attention to whether a person of ordinary skill would have understood that the surface image at farther distance A3 is larger than at closer distance A4.

As discussed above, Dr. Otto contends that a person of ordinary skill would recognize that common 34 mm and 42 mm lenses could be employed to permit imaging at two distances where the surface field of view at the further distance exceeds that of the closer distance by at least 25%. *See also* Reply 23. Petitioner disputes Patent Owner's contentions that Dr. Otto failed to consider the apertures available for such lenses and that apertures that would permit such imaging are not available; Petitioner argues that most lenses come with a wide range of apertures suitable for such use. *Id.* Except to argue that Petitioner did not previously argue that Hoefflin employed an available aperture, Patent Owner does not reply to these arguments. *See* Sur-reply 24. Instead, Patent Owner contends that Petitioner summarily concludes a person of ordinary skill would understand how to select "unknown optical characteristics" missing from Dr. Otto's analysis. As discussed above, Petitioner acknowledges that neither Plassmann nor

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Treuilett discloses the actual focal length of their lenses, but Dr. Otto states that a person of ordinary skill would understand such devices may be used with any lens suitable to the subject. Pet. 50. We agree with Petitioner that Dr. Otto's testimony provides sufficient reasoning with rational underpinning to support the proposition that a person of ordinary skill in the art would have known how to select the requisite lenses to achieve the results recited in claim 11. *See KSR*, 550 U.S. at 418 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring "articulated reasoning with some rational underpinning to support the legal conclusion of obviousness")).

Having considered the arguments and evidence of record, for the reasons discussed above, we find that Petitioner has demonstrated that a person of ordinary skill would have had reason to combine the teaching of Plassmann, Treuilitt, and Staller and that their combined teachings would have disclosed or suggested the subject matter of claim 11 to a person of ordinary skill.

Claim 12 depends from claim 11 and recites fields of view at closer position (A4) equal to an A4 surface format, plus 100% or minus 40%, and the farther position (A3) equal to an A2 surface format, plus 100% or minus 40%. Citing its arguments concerning claim 11, Petitioner argues that it would have been within the routine skill of an ordinarily skilled artisan to configure a variety of lens configurations using Plassmann's device to provide various fields of view, including ones with the claimed dimension, to capture the larger areas of a subject's body. Pet. 53–56. Patent Owner repeats its assertions that Dr. Otto's analysis of claim 12 is flawed. PO Resp. 56–57. For similar reasons as those we articulated concerning claim 11, we find that Petitioner has demonstrated that a person of ordinary skill

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would have had reason to combine the teaching of Plassmann, Treuilitt, and Staller and that their combined teachings would have disclosed or suggested the subject matter of claim 12 to a person of ordinary skill.

3. *Claims 2–5, 9, 10, 15, 16, and 20*

Claims 2–5, 9, 10 and 12 are device claims that depend directly or indirectly from claim 1. Claims 15, 16, and 20 directly or indirectly recite a method using the device recited in claim 1. We have reviewed Petitioner’s arguments and evidence regarding these claims. Patent Owner does not address these claims separately and has waived argument concerning them. Based on the arguments and evidence of record, we find that Petitioner has demonstrated that a person of ordinary skill would have had reason to combine the teachings of Plassmann, Treuilett, and Staller and that the combined teachings of these references would have disclosed or suggested the limitations of claims 2–5, 9, 10, 15, 16 and 20 to an ordinarily skilled artisan.

G. *Claims 21–23 As Obvious Over Plassmann, Treuillet, Staller and Peng*

Claims 21–23 are method claims that depend directly or indirectly from claim 15. Claim 15 recites a method of using the device recited in claim 1. Claims 21–23 are directed to reconstructing 3-D dimensional surface of the target subject. *See* Ex. 1022, 14:48–15:19. Petitioner observes “[t]he ’334 patent does not explain how POSITA is to perform these steps, stating only such processing be performed ‘by a program in a computer’” and “[t]he use of a stereo-pair of images to reconstruct a 3-Dimensional surface would have been well-known to POSITA—this is the primary purpose in stereophotogrammetry for such image pairs.” Pet. 61, 63 (citing Ex. 1022, 7:42–47; *see also id.* at 10:38–48; Ex. 1003, Otto Decl.

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¶¶ 334, 428). Nevertheless, noting that Peng “discusses methods for ‘3D model stitching for adjacent scenes’ from multiple stereo-pairs . . . by spatially matching at least three noncollinear points between different 3D models,” Petitioner cites Peng as “disclos[ing] reconstruction of comprehensive 3D geometries using passive, image-based methods, such as those referred to in Plassmann and Treuillet.” *Id.* at 66–67 (citing Ex. 1009, 1–6; Ex. 1003, Otto Decl. ¶¶ 342, 346, 428).

Patent Owner does not address claims 21–23, except to argue that Peng does not cure the deficiencies Patent Owner pointed out with respect to claim 1. PO Resp. 68.

Having considered all the arguments and evidence of record, we find that Petitioner has demonstrated that a person of ordinary skill would have had reason to combine the teachings of Peng with those of Plassmann, Treuillet and Staller and that their combined teachings would have disclosed or suggested the limitations of claim 21–23 to such an ordinarily skilled artisan.

VII. MOTION TO EXCLUDE

Patent Owner’s Motion to Exclude seeks to exclude two areas of evidence. We address each in turn.

A. Exclusion of Dr. Otto’s Testimony to the Extent it Espouses and Relies on Inadmissible Hearsay

Patent Owner argues that testimony of Petitioner’s witness, Dr. Otto, should be excluded to the extent Dr. Otto relies on statements regarding the depth of field of the MAVIS II system discussed in Treuillet because Treuillet’s statements are hearsay and not the kinds of fact an expert would reasonably rely upon. Mot. to Excl. 1–13. Patent Owner further argues that Treuillet’s description of MAVIS II is inconsistent with Plassmann’s

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writings concerning MAVIS II and should be excluded for this reason as well. *Id.* at 13–14.

Patent Owner’s arguments for exclusion are unpersuasive for at least three reasons. First, as Petitioner argues in opposition to the motion to exclude, Treuillet is admissible as prior art. Opp. Mot. Excl. 2–3. Petitioner and Dr. Otto rely on Treuillet for what the Treuillet reference teaches to a person having ordinary skill in the art at the relevant time. Treuillet’s suggestions to a person having ordinary skill in the art remain relevant even if Treuillet were factually incorrect in some respects.

Second, even if considered hearsay, Dr. Otto properly relied on Treuillet. *Id.* at 4–7. Federal Rule of Evidence 703 provides that an expert may rely on facts and data that “need not be admissible.” Here, the evidence supports that Treuillet was published in an independent, respected, and peer-reviewed IEEE journal. *Id.* at 5–6 (citing evidence regarding reliability of the IEEE journal). Thus, Treuillet is the kind of evidence we would expect an expert witness or person having ordinary skill in the art to rely upon, and Dr. Otto was entirely reasonable on relying on Treuillet in forming his opinions.

Third, even if Treuillet were inconsistent with other evidence, such as Plassmann, this issue goes to the credibility of Dr. Otto’s testimony and the weight given to it in deciding ultimate issues of fact, rather than its admissibility.

For the reasons above, we deny Patent Owner’s motion to exclude with respect to Dr. Otto’s testimony.

B. Exhibits 1018, 1019, 1026, 1028, 1029, 1030, and 1033

Patent Owner seeks to exclude Exhibits 1018, 1019, 1026, 1028, 1029, 1030, and 1033 because “the Petition does not cite or otherwise rely

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on them.” Mot. to Excl. 15. Petitioner argues that it relied on exhibits 1026, 1029, 1030, 1033 and 1034, in the Petition and in cited paragraphs of Dr. Otto’s declaration. Opp. Mot. Excl. 12 (citing, e.g., Pet. 5, 38, 44, 46–47, 53–58, 60, 72, 75; Ex. 1003, Otto Decl. ¶¶ 161–163, 323, 390–391, 410, 413–414). Petitioner acknowledges that it did not rely on Exhibits 1018, 1019, and 1028, but argues that Patent Owner’s request is unnecessary and should be denied as moot. *Id.*

In rendering our decision, we only consider Petitioner’s evidence to the extent it is properly presented in the Petition or the Reply. We consider Petitioner’s evidence that Dr. Otto cites only to the extent explanation of the evidence is properly presented in the Petition or the Reply or only for purposes of assessing whether Dr. Otto’s testimony presented in the Petition or the Reply is well-grounded. As such, resolution of Patent Owner’s motion to exclude with respect to these exhibits would have no affect our decision making and is therefore moot.

VIII. PATENT OWNER’S OBJECTION TO DEMONSTRATIVES

Patent Owner objects to certain of Petitioner’s demonstratives for oral argument because, for example, the demonstratives constitute evidence that Petitioner did not reference or discuss in a prior paper, according to Patent Owner. *See, e.g.,* Paper 57 (“PO Objs.”) 2. Patent Owner also objects to certain demonstratives as mischaracterizing the record. *Id.* at 1.

Demonstratives for oral argument are not evidence, and we do not rely on demonstratives as evidence in our decision making. Paper 44, 3. Because demonstratives are not evidence and we do not rely on them in making our decision making, Patent Owner’s objections to the demonstratives likewise do not affect our decision making and are therefore moot.

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IX. CONCLUSION¹⁸

Having considered the arguments and evidence on record, we conclude the Petitioner has demonstrated by a preponderance of the evidence that all the challenged claims are unpatentable.

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–5, 9–12, 15, 16, 20	103	Plassmann, Treuilett, Staller	1–5, 9–12, 15, 16, 20	
21–23	103	Plassmann, Treuilett, Staller, Peng	21–23	
Overall Outcome			1–5, 9–12, 15, 16, 20–23	

X. ORDER

In consideration of the above it is:

ORDERED that claims 1–5, 9–12, 15, 16, and 20–23 are unpatentable;

FURTHER ORDERED that Patent Owner's Motion to Exclude is denied with respect to evidence addressed by Section VII.A, *supra*, and is

¹⁸ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. §§ 42.8(a)(3), (b)(2).

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dismissed as moot with respect to evidence addressed by Section VII.B,
supra;

FURTHER ORDERED that Patent Owner's Objections to Petitioner's
Demonstratives are overruled; and

FURTHER ORDERED that that, because this is a Final Written
Decision, parties to the proceeding seeking judicial review of the decision
must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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**UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD**

CANFIELD SCIENTIFIC, INC.,
Petitioner

v.

QUANTIFICARE S.A.,
Patent Owner

CASE NO. IPR 2021-01511

PATENT NO. 10,070,119

PATENT OWNER'S NOTICE OF APPEAL

Pursuant to 35 U.S.C. §§ 141, 142 and 319, and 37 C.F.R. §§ 90.2 and 90.3, Patent Owner QuantifiCare S.A. hereby provides notice that it appeals to the United States Court of Appeals for the Federal Circuit from the Final Written Decision of the Patent Trial and Appeal Board (“the Board”) dated March 9, 2023 (Paper 61) and from all underlying orders, decisions, rulings, and opinions regarding U.S. Patent No. 10,070,119 B2 in Inter Partes Review No. IPR2021-01511. This Notice is timely under 37 C.F.R. § 90.3, having been filed within 63 days after the date of the Final Written Decision. A copy of the Final Written Decision is attached as Exhibit A.

Pursuant to 37 C.F.R. § 90.2(a)(3)(ii), Patent Owner anticipates that the issues on appeal may include but are not limited to: the Board’s determination that claims 1–4 and 8-11 are unpatentable under 35 U.S.C. § 103(a); the Board’s claim constructions; the Board’s failure to consider material evidence presented in the proceeding; the Board’s consideration of new arguments and evidence presented by Petitioner for the first time in its reply; the Board’s failure to adequately explain the rationales for the foregoing; and any other of the Board’s findings or determinations supporting or relating to these issues, as well as all other issues the Board decided adversely to Patent Owner in any order, decision, ruling, or opinion.

Pursuant to 35 U.S.C. § 142, 37 C.F.R. § 90.2(a), and Fed. Cir. R. 15(a)(1), this Notice is being filed with the Patent Trial and Appeal Board, the Clerk’s Office

of the United States Court of Appeals for the Federal Circuit via CM/ECF, and the
Director of the United States Patent and Trademark Office.

Date: May 9, 2023

Respectfully Submitted

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CERTIFICATE OF FILING AND SERVICE

Pursuant to 37 C.F.R. § 42.6(e), Fed. R. App. P. 25 and Fed. Cir. R. 25, the undersigned hereby certifies that on May 9, 2023, a true and correct copy of the foregoing PATENT OWNER'S NOTICE OF APPEAL has been caused to be filed with the Patent Trial and Appeal Board through the Board's electronic filing system, filed with the Director of the United States Patent and Trademark Office by USPS Express Mail service (Label No. EK 844420670 US) to the following address:

Director of the United States Patent and Trademark Office
c/o Office of the General Counsel
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Alexandria, VA 22313-1450

filed with the Clerk's Office of the United States Court of Appeals for the Federal Circuit via CM/ECF, along with the required filing/docketing fees; and served via electronic and first class mail on counsel of record for Petitioner as set forth below:

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Case: 23-1918 Document: 13 Page: 221 Filed: 06/29/2023

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**UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD**

CANFIELD SCIENTIFIC, INC.,
Petitioner

v.

QUANTIFICARE S.A.,
Patent Owner

CASE NO. IPR 2021-01518

PATENT NO. 10,165,253

PATENT OWNER'S NOTICE OF APPEAL

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UNITED STATES PATENT AND TRADEMARK OFFICE

Pursuant to 35 U.S.C. §§ 141, 142 and 319, and 37 C.F.R. §§ 90.2 and 90.3, Patent Owner QuantifiCare S.A. hereby provides notice that it appeals to the United States Court of Appeals for the Federal Circuit from the Final Written Decision of the Patent Trial and Appeal Board (“the Board”) dated March 9, 2023 (Paper 61) and from all underlying orders, decisions, rulings, and opinions regarding U.S. Patent No. 10,165,253 B2 in Inter Partes Review No. IPR2021-01518. This Notice is timely under 37 C.F.R. § 90.3, having been filed within 63 days after the date of the Final Written Decision. A copy of the Final Written Decision is attached as Exhibit A.

Pursuant to 37 C.F.R. § 90.2(a)(3)(ii), Patent Owner anticipates that the issues on appeal may include but are not limited to: the Board’s determination that claims 1–4, 8-12, 15, 16 and 20-23 are unpatentable under 35 U.S.C. § 103(a); the Board’s claim constructions; the Board’s failure to consider material evidence presented in the proceeding; the Board’s consideration of new arguments and evidence presented by Petitioner for the first time in its reply; the Board’s failure to adequately explain the rationales for the foregoing; and any other of the Board’s findings or determinations supporting or relating to these issues, as well as all other issues the Board decided adversely to Patent Owner in any order, decision, ruling, or opinion.

Pursuant to 35 U.S.C. § 142, 37 C.F.R. § 90.2(a), and Fed. Cir. R. 15(a)(1), this Notice is being filed with the Patent Trial and Appeal Board, the Clerk’s Office

of the United States Court of Appeals for the Federal Circuit via CM/ECF, and the
Director of the United States Patent and Trademark Office.

Date: May 9, 2023

Respectfully Submitted

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Case: 23-1917 Document: 25 Page: 673 Filed: 03/19/2024
Case: 23-1918 Document: 13 Page: 225 Filed: 06/29/2023

CERTIFICATE OF FILING AND SERVICE

Pursuant to 37 C.F.R. § 42.6(e), Fed. R. App. P. 25 and Fed. Cir. R. 25, the undersigned hereby certifies that on May 9, 2023, a true and correct copy of the foregoing PATENT OWNER'S NOTICE OF APPEAL has been caused to be filed with the Patent Trial and Appeal Board through the Board's electronic filing system, filed with the Director of the United States Patent and Trademark Office by USPS Express Mail service (Label No. EK 844420670 US) to the following address:

Director of the United States Patent and Trademark Office
c/o Office of the General Counsel
P.O. Box 1450
Alexandria, VA 22313-1450

filed with the Clerk's Office of the United States Court of Appeals for the Federal Circuit via CM/ECF, along with the required filing/docketing fees; and served via electronic and first class mail on counsel of record for Petitioner as set forth below:

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**UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD**

CANFIELD SCIENTIFIC, INC.,
Petitioner

v.

QUANTIFICARE S.A.,
Patent Owner

CASE NO. IPR 2021-01519

PATENT NO. 10,681,334

PATENT OWNER'S NOTICE OF APPEAL

Pursuant to 35 U.S.C. §§ 141, 142 and 319, and 37 C.F.R. §§ 90.2 and 90.3, Patent Owner QuantifiCare S.A. hereby provides notice that it appeals to the United States Court of Appeals for the Federal Circuit from the Final Written Decision of the Patent Trial and Appeal Board (“the Board”) dated March 17, 2023 (Paper 60) and from all underlying orders, decisions, rulings, and opinions regarding U.S. Patent No. 10,681,334 B2 in Inter Partes Review No. IPR2021-01519. This Notice is timely under 37 C.F.R. § 90.3, having been filed within 63 days after the date of the Final Written Decision. A copy of the Final Written Decision is attached as Exhibit A.

Pursuant to 37 C.F.R. § 90.2(a)(3)(ii), Patent Owner anticipates that the issues on appeal may include but are not limited to: the Board’s determination that claims 1–5, 12, 15, 16 and 20-23 are unpatentable under 35 U.S.C. § 103(a); the Board’s claim constructions; the Board’s failure to consider material evidence presented in the proceeding; the Board’s consideration of new arguments and evidence presented by Petitioner for the first time in its reply; the Board’s failure to adequately explain the rationales for the foregoing; and any other of the Board’s findings or determinations supporting or relating to these issues, as well as all other issues the Board decided adversely to Patent Owner in any order, decision, ruling, or opinion.

Pursuant to 35 U.S.C. § 142, 37 C.F.R. § 90.2(a), and Fed. Cir. R. 15(a)(1), this Notice is being filed with the Patent Trial and Appeal Board, the Clerk’s Office

of the United States Court of Appeals for the Federal Circuit via CM/ECF, and the Director of the United States Patent and Trademark Office.

Date: May 12, 2023

Respectfully Submitted

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Director of the United States Patent and Trademark Office
c/o Office of the General Counsel
P.O. Box 1450
Alexandria, VA 22313-1450

filed with the Clerk's Office of the United States Court of Appeals for the Federal Circuit via CM/ECF, along with the required filing/docketing fees; and served via electronic and first class mail on counsel of record for Petitioner as set forth below:

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